I-405
CORRIDOR PROGRAM NEPA/SEPA DRAFT EIS

DRAFT WETLANDS EXPERTISE REPORT

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I-405 CORRIDOR PROGRAM
Draft Wetlands Expertise Report

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Wetlands Expertise Report

SUMMARY

This discipline report provides an assessment of the impacts on wetland resources of four proposed action alternatives and a No Action Alternative for the I-405 Improvements Project. The analysis is conducted at a programmatic level to assist decision-makers with their evaluations of alternatives.

Approximately 740 wetlands either bisect or occur adjacent to proposed transportation improvements. Thousands more wetlands exist within the study area but are distant from proposed transportation improvements. Each of the alternatives, including the No Action Alternative, potentially impacts wetlands. In some circumstances, wetland alterations may be minimized or avoided through the project-level design. In other circumstances, wetland impacts are unavoidable. Table S.1 provides a summary of the potential wetland affected by each of the alternatives.

Table S.1: Summary of Wetlands Affected by Alternative

Alternative	Total Wetlands Affected	High priority Wetlands Affected	Estimated Total Wetland Fill in Acres
No Action	57	19	12
1	81	34	13
2	210	70	52
3	168	56	61
4	233	62	84

The number of wetlands potentially affected generally increases with alternatives containing new roadway construction or substantial road widening. Total wetland acreage potentially affected also increases proportionate to the amount of new construction and widening proposed. New alignments have the greatest potential to degrade wetland habitats through fragmentation, while widening of existing roads has the least potential to fragment wetlands.

The alternatives also vary in the opportunities they provide to avoid wetlands through project-level design. For instance, new alignments such as the transit system proposed in Alternatives 1 and 2 generally have the greatest potential to avoid wetland resources. While portions of the alignment follow existing Burlington Northern Santa Fe Railroad (BNSF) right-of-way, the transit system's wetland crossings are predominantly along those segments off the BNSF right-of-way. Widening of existing roadways and related facilities provides less opportunity to avoid wetlands than does the construction of new alignments. Small roadway connections provide intermediate avoidance opportunities. Table S.2 summarizes potential impacts and mitigation of each alternative.

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Table S.2: Summary of Potential Impacts and Possible Mitigation Measures

Summary of Findings		
Element	**Environmental Consequences**	**Summary of Mitigation**
No Action Alternative	Of the approximately 740 wetlands in the study area, 190 are considered High Priority wetlands. The remainder is considered Lower Priority. The No Action Alternative would potentially impact 57 wetlands, including 19 High Priority wetlands, totaling approximately 12 acres of encroachment. This is the lowest number of High Priority wetlands and the least area affected of any alternative. Most No Action Alternative improvements near High Priority wetlands occur in Redmond, Woodinville, and Renton. Committed arterial projects would impact the greatest number of wetlands of all project types in this alternative. Arterial committed projects would affect 37 wetlands, 17 of which are High Priority systems. No new roads are proposed in this alternative. Therefore, the potential for this alternative to fragment wetland habitat is low. This alternative also results in the lowest increase in impervious surface of all the alternatives. Pollutant loading and overall impacts to wetlands from the improvements were judged to be below the threshold of significance. Retrofitting of existing facilities could occur in conjunction with many of the projects. Because new roads or transit systems are not proposed under the No Action Alternative, the noise impacts to wetlands would be relatively slight.	Because wetland functions generally vary between High and Lower Priority wetlands, mitigation needs also vary. High Priority wetlands would require higher mitigation ratios Mitigation would be constructed, where feasible, prior to wetland impacts to reduce temporary losses of wetland functions. This analysis assumes that sufficient property is available within the study area for mitigation. Wetland mitigation sites would have to be found within each watershed, preferably in proximity to the filled area. Mitigation sites should provide connectivity with the remaining wetlands within the basin whenever possible, although isolated wetlands in highly developed areas are not without value, as they provide habitat for urban wildlife. In some instances, out-of-kind watershed restoration may provide adequate or even higher levels of wetland/watershed functions than in-kind wetland replacement. While out-of-kind restoration is an alternative mitigation measure, its value would be assessed on a case-by-case basis. Regional wetland mitigation facilities may have the potential to improve many of these functions, particularly fish-rearing habitat, peak flow attenuation, large habitat areas with limited disturbance and edge area, and low flow augmentation. Some typical avoidance measures include: • Using or lengthening bridges to cross streams and their associated riparian corridors and wetlands; • Using retaining walls to reduce or eliminate lateral extensions of road embankment slopes into wetlands; • Using guardrails to increase the grade of embankments and avoid wetland fill; • Stacking or constructing viaducts;

Summary of Findings		
Element	**Environmental Consequences**	**Summary of Mitigation**
		• Constructing tunnels; and • Using buried stormwater detention facilities to avoid placement in wetlands or wetland buffers. Best management practices (BMPs) would be required to minimize short-term noise, sedimentation, and contamination. These practices may include procedures such as sediment fences, check dams, temporary seeding, mulching, jute netting, phased construction, and construction during less sensitive seasons. While BMPs can reduce the impact of sediment, oils, and greases, having disturbed ground with heavy construction equipment present typically leads to increased inputs of these constituents to wetlands and drainages. Best available technology would be used and construction would be staged to occur during dry periods. Stormwater treatment facilities would be designed to meet Ecology, local, and/or WSDOT standards. *3.6.7.2 Specific Mitigation* Approximately 12 acres of wetland would be filled and would require mitigation under the No Action Alternative. Because this alternative potentially impacts the fewest numbers of wetlands and the least wetland acreage, the need for out-of-kind mitigation is consequently the lowest. As with all alternatives, the relative merits of out-of-kind mitigation would be assessed at the project level and the appropriate mitigation ratio selected. The level of design available does not allow for the analysis of most of these techniques. However, the project-level design will consider all appropriate technologies to minimize wetland impacts.
Alternative 1	Alternative 1 would potentially impact 81 wetlands, including 34 High Priority wetlands, totaling approximately 13 acres of fill. This is the lowest number of High Priority wetlands and least area affected of the action alternatives. All impacts are in addition to the baseline impacts associated with the No Action Alternative. Nine acres of the wetlands to potentially be impacted are associated with arterial HOV and HCT projects. Some of these impacts may be avoidable or minimized through engineering design refinements. All strategies would be pursued during project-level design. Approximately 7 acres of fill could be avoided by realigning HOV arterials	Mitigation strategies are the same as for the No Action Alternative. However, Alternative 1 impacts roughly twice the wetland area as the No Action Alternative, and mitigation needs would subsequently be higher. In comparison to Alternatives 2, 3 and 4, Alternative 1 would require the least mitigation, and is in this respect the most desirable of the action alternatives. The exact ratio of original wetlands to mitigated land would be determined by project-level assessment.

Summary of Findings		
Element	**Environmental Consequences**	**Summary of Mitigation**
	and/or elevating the HCT. While some part of the HCT system proposed under this alternative may fragment wetlands, much of the new construction presents opportunities to avoid wetlands. The potential for this alternative to fragment wetland habitat is consequently low to moderate. The amount of construction required for this alternative, while greater than that required for the No Action Alternative, is considerably less than for the other action alternatives.	
Alternative 2	Alternative 2 would potentially impact 210 wetlands, 70 of which are High Priority wetlands, totaling approximately 52 acres of fill in addition to the 12 acres affected by the No Action Alternative. This is the highest number of High Priority wetlands impacted of any alternative. Widening SR 167 from I-405 to the study boundary has the most potential to substantially alter wetlands/wetland buffers. Some impacts associated with riparian wetland crossings (e.g., the Green River or the Sammamish River) would likely be unavoidable. The potential for this alternative to fragment wetland habitat is high in comparison to the other action alternatives. Impervious surface area doubles with this alternative compared to Alternative 1. Many of the impacts associated with Alternative 2 are unavoidable, as they are expansions or additions to existing roads and realignment is not practical.	Alternative 2 would require mitigation for 4 times more land than the No Action Alternative and opportunities to avoid wetlands through realignment are less than with Alternative 1.
Alternative 3	Alternative 3 would potentially impact 168 wetlands, including 56 High Priority wetlands, totaling 62 acres of fill. This is the next to lowest number of High Priority wetlands impacted of the action alternatives, but the next to highest area affected by fill. Potential for this alternative to fragment wetland habitat is moderate to high, while opportunities to avoid wetlands by realigning proposed roads are few.	Alternative 3 would require mitigation for 5 times more wetland acres than the No Action Alternative, and avoidance opportunities are fewer.
Alternative 4	Alternative 4 would potentially impact 233 wetlands, including 62 High Priority wetlands, totaling 84 acres of wetland area filled. This is the next to highest number of High Priority wetlands impacted, and the greatest area affected of any alternative. Thus there is great potential for wetlands fragmentation, coupled with little opportunity to avoid wetlands by altering proposed alignments. Noise impacts on wetlands are also the highest of any alternative. The greatest area of impervious surface is added in this alternative.	Alternative 4 would require the most mitigation of all alternatives, as it impacts more than 6 times the wetland area impacted under the No Action Alternative. Avoidance opportunities are few.

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1. INTRODUCTION

1.1 Report Organization and Scope

This report presents an evaluation of the potential impacts of five alternative approaches to traffic and transportation-related improvements in the Interstate 405 (I-405) corridor on wetlands.

The report is divided into six general sections, followed by references and appendices. The sections are:

Section 1 – provides a basic understanding of the purpose and scope of the study area and the improvements under consideration.

Section 2 – gives a brief description of each of the four action alternatives and one No Action Alternative being evaluated.

Section 3 - describes the methodology used for the wetland impact analysis, explains the notable criteria used in this report, and discusses the general regulatory requirements affecting the program.

Section 4 - describes the general existing conditions in the project area related to wetlands.

Section 5 – discusses the potential project impacts to wetlands under each alternative. Both construction and long-term operational impacts are examined.

Section 6 – compares wetland impacts among the alternatives.

1.2 Overview of I-405 Corridor Program

Construction of the 30-mile Interstate 405 (I-405) freeway in the early 1960s as a bypass around Seattle for Interstate 5 (I-5) traffic also opened the rural, agricultural countryside east of Lake Washington to commercial and residential development. Interstate 405 currently ranges from six to ten lanes along the 30-mile corridor, and it is the designated military route through Seattle, as Interstate 5 was deemed too constricted (see Figure 1.1). Construction of the Evergreen Point (SR 520) floating bridge in 1963 further set the stage for rapid and substantial changes on the Eastside.

Today, I-405 has changed dramatically from a Seattle bypass to become the region's dominant north-south travel corridor east of I-5. More than two-thirds of the total trips on I-405 begin and end in the corridor itself. The remaining third have strong ties with the communities along SR 167 to the south of the study area, and with developing areas to the east within the urban growth area of King County. However, as the regional importance of the I-405 corridor has grown, it has become increasingly evident that worsening traffic congestion within the corridor has the potential to create serious adverse effects on personal and freight mobility, the environment, the state and regional economy, and the quality of life.

In response to these and other concerns, the Washington State Department of Transportation (WSDOT) has joined with the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Central Puget Sound Regional Transit Authority (Sound Transit), King County, and local governments to develop strategies to reduce traffic congestion and improve mobility in the I-405 corridor from Tukwila in the south to Lynnwood in the north.

The I-405 Corridor Program is a cooperative effort involving over 30 agencies that have responsibilities for planning, regulating, and implementing transportation improvements in the 250+ square-mile corridor. The decision to be made through this combined National Environmental Policy Act / State Environmental Policy Act is to identify the best mix of modal solutions, transportation investments, and demand management to improve movement of people and goods throughout the I-405 corridor, reduce foreseeable traffic congestion, and satisfy the overall program purpose and need.

The programmatic I-405 Corridor Program EIS focuses on broad corridor-wide issues related to travel mode and transportation system performance. This is consistent with the program objective to enable program decisions focusing on mode choice, corridor selection, general location of improvements, and how combinations of improvements may function together as a system to solve corridor-wide transportation problems. A programmatic level of analysis is appropriate and necessary at this early stage in the decision-making process, when many project-level design details would not be meaningful in evaluating effects on mobility and environmental quality across such a large area. Subsequent environmental analysis, documentation, and review will be prepared to enable decisions regarding site-specific, project-level details on alignments, high-capacity transit technology, project impacts, costs, and mitigation measures after a preferred alternative has been identified.

1.3 Need For the Proposed Action

The need identified for the I-405 Corridor Program is:

> To improve personal and freight mobility and reduce foreseeable traffic congestion in the corridor that encompasses the I-405 study area from Tukwila to Lynnwood in a manner that is safe, reliable, and cost-effective.

The following sub-sections expand upon the issues and trends that influence the need for the proposed action, particularly with respect to travel demand and traffic congestion, and the attendant effects on freight mobility and safety.

1.3.1 Growth in Travel Demand

Between 1970 and 1990, communities in the I-405 corridor grew much faster than the central Puget Sound region as a whole. During the 20-year period, employment in the study area increased over 240 percent from 94,500 to 323,175 and population grew nearly 80 percent from 285,800 to 508,560.

Population and employment continued to grow during the 1990s; in particular, employment grew at an annual rate of almost 3.5 percent. Looking ahead, growth in the corridor through 2020 likely would keep pace with the robust rate of growth in the Puget Sound region. The I-405 corridor population and employment is forecast to increase by more than 35 percent. This means that by 2020 an additional 144,000 people are expected to be employed within the study area, while the population is expected to reach approximately 765,000, an increase of more than 200,000 people from 1997.

1.3.1.1 Travel Demand

Travel demand trends in the I-405 corridor match these population and employment trends: between 1995 and 2020, person trips are generally expected to increase more than 50 percent. Travel demand in terms of traffic volume is heaviest within the study area on I-405 itself, with the freeway carrying 60 to 70 percent of the total daily traffic volumes passing though the study area in the north-south direction. Conversely, the arterial streets carried 30 to 40 percent. In the east-west direction, the arterial street system plays an important role, with volumes almost equally distributed between the arterial streets and the two east-west freeways, I-90 and SR 520. In 1999, the highest volumes on I-405 occurred in the vicinity of NE 8th Street in Bellevue: about 210,000 vehicles per day. I-405 at SR 900 in Renton typified traffic volumes on I-405 south of I-90, carrying about 138,000 vehicles per day.

WSDOT's most recent traffic count data (1999) show the lowest I-405 traffic volumes, 95,000 vehicles per day, in the north end between SR 522 and I-5 at Swamp Creek, and the highest, 210,000 vehicles per day, between I-90 and SR 520. The section south of Kirkland to SR 520 carries 185,000 to 195,000 vehicles per day, and the section south of I-90 typically carries 150,000 vehicles per day. Figure 1.2 shows these findings. This variation in traffic volumes is the result of different travel demands within the corridor as well as the available capacity on the freeway.

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Legend: Study Area

- Study Area Boundary
- Urban Growth Area
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Hunts Point
Yarrow Point
Clyde Hill
Medina
NE 8th St
Bellevue
148th Ave SE
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
Mercer Island
Sammamish
Duwamish River
Newcastle
Coal Creek Pky SE
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
Kent
132nd Ave SE
Des Moines
Covington
Auburn
Federal Way
Everett
Seattle
Tacoma

5 90 405 527 524 522 202 99 520 509 900 167 515 169 203 18 516

Study Area

Figure No. 1.1

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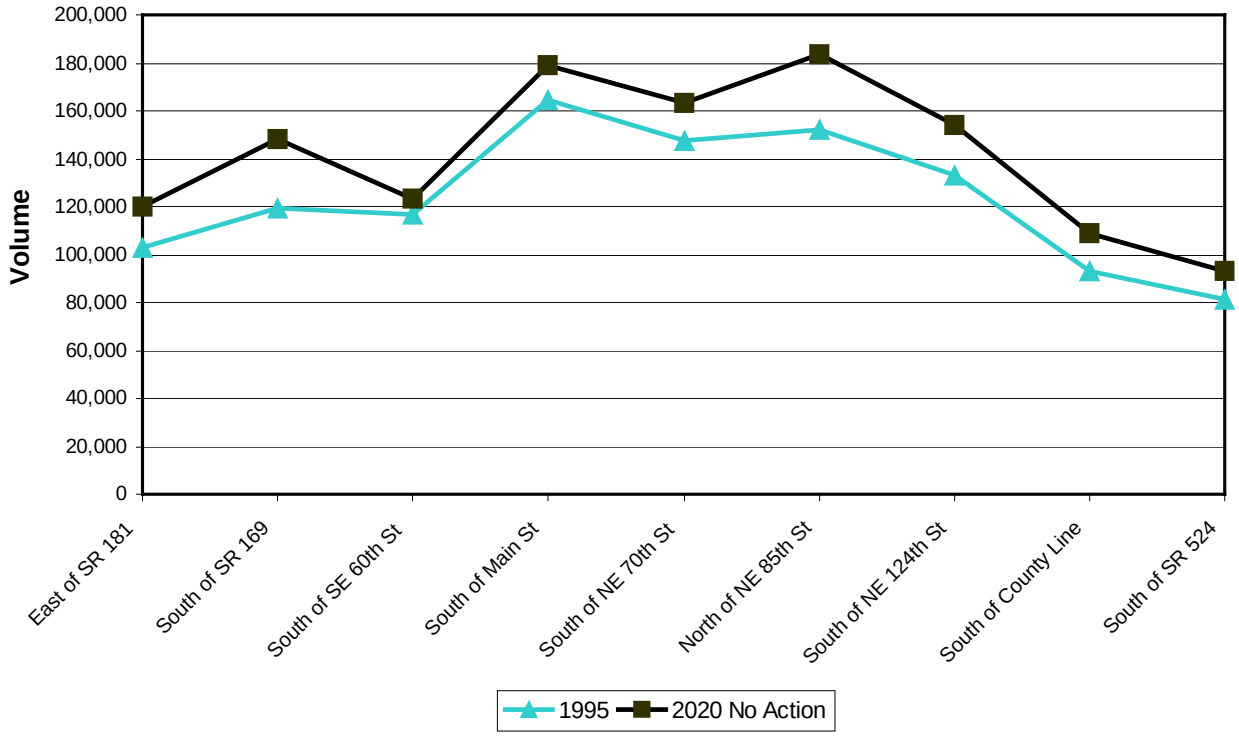
Figure 1.2: Daily Traffic Volumes at Selected Locations on I-405



Source: PSRC Model

1.3.1.2 Mode Split

Single-occupant vehicles (SOVs) generate the majority of traffic demand: up to 78 percent of work trips within the I-405 study area are SOVs. High-occupancy vehicles (HOVs) and transit users comprise around 20 percent of all work trips within the study area. SOV use in the study area is higher than the average for King County, while HOV and walk/bike percentages are lower. These results reflect the more suburban character of the I-405 study area.

The segment of I-405 with the highest peak-period transit ridership is between SR 520 and the Totem Lake area (2,100 riders). Transit ridership near each of the northern and southern termini of I-405 is less than 1,000 riders during peak periods. To encourage more transit demand, Sound Transit's Regional Express program is currently in the planning and early design stages of new park-and-ride lots, transit centers, and direct access ramps, including large-scale improvements to several I-405 interchanges. King County Metro and Sound Transit's evolving bus transit services concept for the I-405 study area would serve multiple activity centers, instead of the traditional Seattle/Bellevue hub-and-spoke design.

1.3.1.3 Trip Characteristics

Travel demand on I-405 appears greater for longer trips; along several sections of I-405, the average vehicle trip length exceeds 25 miles, roughly three times the study area average. Forecasts for 2020 show the freeway attracting even more long trips, with over 50 percent of all trips on I-405 exceeding 30 miles in length.

Today in the study area, only 20 percent of the total daily person-trips are home-based work trips, that is, commute trips directly to and from work. Thirty-nine percent of daily person-trips are other home-based trips (e.g., shopping, recreational, personal business) and 28 percent are non-home-based trips (e.g., traveling from work to daycare or shopping). School (2 percent) and commercial vehicle trips (11 percent) make up the rest. The relative shares of each trip purpose are expected to be similar in 2020. The fairly small share of trips that are purely to and from work reflects the fact that people are increasingly linking their trips, stopping on the way home to shop, pick up children, etc. (which are considered non-home based trips). This poses a challenge for transit and carpool/vanpool use.

1.3.2 Traffic Congestion and Reliability

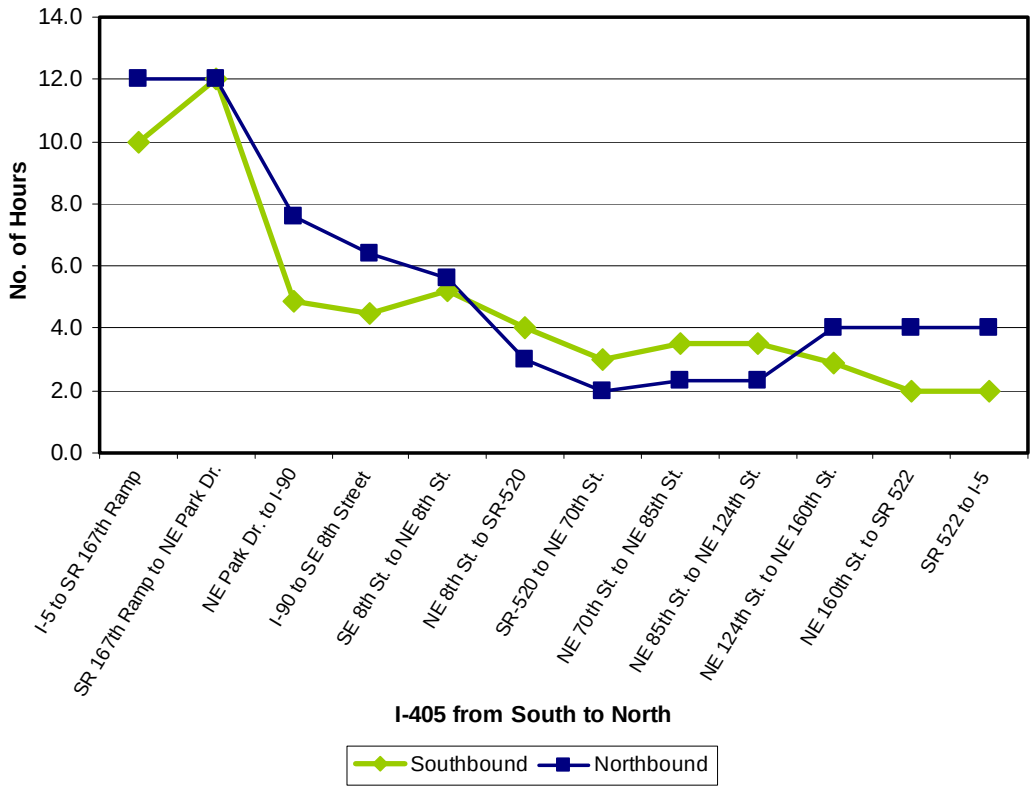
1.3.2.1 Traffic Congestion

Heavy travel demand and frequent traffic incidents contribute to substantial traffic congestion on I-405, although they are not the only causes. Traffic congestion along I-405 is widespread during the morning and afternoon peak periods and has spread to surrounding time periods. A useful way to examine daily congestion is to look at the number of hours during which a facility is congested. For purposes of this analysis, "congestion" on the freeway is defined as travel speeds below 45 mph. Figure 1.3 illustrates the severity of traffic congestion that was present in 1997 at twelve points along I-405. The duration of traffic congestion in the northbound and southbound directions is roughly the same. The most congested area of I-405 is from I-5 in Tukwila to NE Park Drive in the city of Renton. Traffic congestion for 10-12 hours per day is typical in this section. For most other sections, traffic congestion lasts 2 to 7 hours per day.

The average daily "volume per freeway lane" is quite consistent throughout the corridor, which demonstrates that traffic volumes alone do not cause congestion. The most likely reason for the high hours of congestion in the south end of I-405 relates to freeway "friction" caused by curves (e.g., the "S-Curves"), grades (e.g., Kennydale Hill), and complex interchanges at I-5 and SR 167.

Traffic congestion on I-405 often results in blockage of mainline flows throughout the day by vehicles that cannot get onto the ramps at such locations as SR 167, I-90, SR 520, and SR 522. The spill-over traffic from the ramps has created substantial mainline traffic congestion and operational hazards throughout the I-405 corridor. This congestion also causes traffic to back up onto local arterials.

Figure 1.3: Hours of Traffic Congestion on I-405



Source: PSRC Model, Mirai Associates

1.3.2.2 Travel Time

Variation in congestion causes travel times to vary widely within the I-405 study area, depending upon the origin and destination of the trip and the mode of travel being used. Table 1.1 summarizes typical P.M. peak-hour travel times (1995 data) for a variety of study area trips, averaging 23 miles in length. The times are for door-to-door travel, including in-vehicle time and access to the trip's origin and destination. The fastest trips are typically by non-transit HOV mode, particularly for longer trips along I-405 that can take full advantage of the HOV lane system. Traveling along the full length of I-405 during the peak period can take longer than one hour for general traffic. Transit travel times are often at least twice as long as driving the equivalent distance, especially for people walking to the transit stops. Transit travel times are 10 to 15 percent faster for park-and-ride access trips compared with walk access transit trips. This is partially due to shorter wait times at park-and-ride locations created by more frequent transit service.

Table 1.1: Comparison of Typical I-405 Study Area P.M. Peak Hour Travel Times by Mode

Trip	Distance (miles)	General Traffic Travel Time (min)	HOV Travel Time (min)	Transit Travel Time Walk Access (min)	Transit Travel Time Park-and-Ride Access (min)
Bellevue Central Business District (CBD) to Federal Way/Kent	25	56	40	95	83
Renton to Mill Creek	33	65	49	125	105
Bellevue CBD to Edmonds/Lynnwood	19	42	38	85	76
Tukwila/SeaTac to Redmond/Overlake	23	49	39	116	103
Issaquah/Cougar Mt. to Bothell/Kenmore	23	46	39	108	98
Issaquah/Cougar Mt. to Federal Way/Kent	23	56	47	132	118

Source: Puget Sound Regional Council (PSRC) Model - 1995 base year

1.3.2.3 Travel Time Reliability

Not only do travel times vary by segment within the I-405 study area, they are unpredictable from day to day. The reliability of travel times can be defined in terms of deviation from a mean travel time when travelers in the same transportation mode repeat their trips with identical travel routes starting at a same time of day. A transportation system provides a good level of service when travelers experience the same travel time every time or with little deviation.

The Washington State Transportation Center (TRAC) conducted research to measure the performance of the freeway system in the Central Puget Sound area, which includes the travel time reliability measure for general traffic along I-405. The most recent analysis results are described in the report entitled Central Puget Sound Freeway Network Usage and Performance, 1999 Update, Volume 1 (Washington State Transportation Center and Washington State Department of Transportation). The following summarizes the findings of the travel time reliability data prepared by the TRAC for 1999.

- Existing travel time reliability for the vehicles traveling from Tukwila to Bellevue CBD is very poor during the mid-day and evening periods and extremely poor during the morning peak period.
- Existing travel time reliability for the vehicles traveling from Bellevue CBD to Tukwila is poor throughout the day (from 6:00 A.M. to 6:30 P.M.). In particular, the travel time reliability during the afternoon peak period is very poor and the traffic flows in the period are highly unstable.
- Existing travel time reliability for the trips from Bellevue CBD to SR 522 is relatively poor during the P.M. peak period. Travelers starting trips during other periods have experienced good travel time reliability.
- Existing travel time reliability problems for the trips from SR 522 to Bellevue CBD are confined to the A.M. peak period. The problem is worst at 8 A.M.

Traffic incidents along the freeway corridor are major causes of the reliability problems. The State's Incident Management Program was implemented to help improve overall

travel time reliability within the I-405 Corridor. Reliability of travel in the HOV lanes is considerably better than in the general purpose lanes. HOV travel times typically operate from 15-20 miles per hour faster than the adjacent general purpose lanes during congested time periods. HOV travel time reliability suffers when there is a major incident along I-405 with stop-and-go conditions. In these situations, HOV speeds drop and the level of HOV lane violations tends to increase.

1.3.3 Freight Mobility

The decreasing reliability of the regional transportation system, including I-405, is creating a serious problem for regional freight mobility. The central Puget Sound region serves as an important freight gateway to Pacific Rim countries. Automobiles, forest and agricultural products, communications and computer equipment, and hundreds of other items continuously move over the region's roadways and railroads, to seaports and airports. Substantial delay as a result of transportation system congestion is costing the region's businesses nearly $700 million a year, according to information from WSDOT. The cost to the freight industry itself is estimated to be around $200 million per year.

Products shipped by truck across I-90 from Eastern Washington reach points north and south of Seattle via I-405. At the same time, I-405 serves as a heavily used transport corridor for local freight delivery to and from the cities along the corridor. Smaller trucks, such as delivery vans, account for many freight trips within the region, and these trips could benefit greatly from roadway improvements to I-405.

Interstate 405 continues to be used by freight carriers as an alternative to the preferred I-5 route when severe congestion occurs on I-5 in downtown Seattle near the Convention Center (one of the most substantial freight mobility bottlenecks in the region). I-405 also provides ready access to the distribution centers along SR 167 in the Kent Valley. Volumes of heavy trucks on the portion of I-405 south of I-90 are about double those along the northern portion due to truck movements to and from the Kent Valley. Truckers identify congestion at the SR 167/I-405 interchange as one of the worst transportation system problems in the region, and the trucking community supports improvements to this major truck corridor interchange as one of its top priorities.

The latest data indicate that the central Puget Sound region's roadways carry approximately 1.2 million truck trips each day, with about 70 percent of those trips occurring within King County. I-405 carries a substantial portion of those trips, moving up to 90 percent of the total truck origins and destinations in east King County. Truck volumes along I-405 are expected to grow by 50 percent by the year 2010. Reductions in system reliability and resulting higher transportation costs increase the cost of manufacturing and distributing goods, while adversely affecting economic vitality and job creation. Accessibility to markets becomes increasingly difficult with worsening traffic congestion and delay. Improvements to the I-405 corridor could provide tangible economic benefits for all of Washington State.

1.3.4 Safety

Twenty-nine of the 280 high accident locations in King and Snohomish counties are located along I-405. Most high accident locations are associated with ramps connecting to

I-405, including those at SR 181 (Interurban), SR 169, SR 900 (Sunset and Park), Coal Creek Parkway, SE 8th Street, NE 4th Street, NE 8th Street, SR 908 (NE 85th Street), NE 116th Street, NE 160th Street, and SR 527. The portion of I-405 north of SR 527 is identified as a high accident corridor due to the relatively higher speeds and more serious injuries associated with these accidents.

Over the three-year period from 1994 to 1996, a total of 5,580 accidents was reported along I-405. Most collisions occurred on the mainline freeway, with about one-fourth of all accidents occurring on the ramps, collector-distributor roads, and cross streets at the interchanges. About half of all collisions involve property damage only, while half involve injuries or fatalities. This injury pattern applies equally to the mainline and ramp segments; however, all seven fatalities reported in this period occurred on the I-405 mainline.

The overall accident rate along I-405 (1.6 accidents per million vehicle miles) is about midrange compared to other freeways in King County. The rates are lower than the average rate for all state highways (1.88 accidents per million vehicle miles, or MVM) and for state highways in King County (2.27 accidents per MVM). On comparable local freeways, I-5 and SR 520 both exhibit accident rates of about 2.0 accidents per MVM. WSDOT's ramp metering program on I-405 has been very successful. Rear-end and sideswipe accidents have decreased by 60 percent to 70 percent near locations with ramp meters.

For state roads serving as surface arterial routes, accident rates typically fall into the range of three to five accidents per MVM. This rate is related to the presence of traffic signals, driveways, pedestrians, and bicyclists, and lower levels of access control. These accident rates are typical of urban arterial facilities. Accident rates for selected arterial and collector routes in the primary study area generally range between two and four accidents per MVM, with some streets higher. These streets also experience higher accident rates due to the presence of signalized intersections, driveways, and other conflicts.

1.4 Purpose of the Proposed Action

The purpose of the proposed action is:

> To provide an efficient, integrated, and multi-modal system of transportation solutions within the corridor that meets the need in a manner that:

- Provides for maintenance or enhancement of livability for communities within the corridor;
- Provides for maintenance or improvement of air quality, protection or enhancement of fish-bearing streams, and regional environmental values such as continued integrity of the natural environment;
- Supports a vigorous state and regional economy by responding to existing and future travel needs; and
- Accommodates planned regional growth.

1.5 Study Area

The study area for the I-405 Corridor Program defines the general boundaries of the I-405 corridor and encompasses the essential improvements proposed within each alternative. It encompasses an area of approximately 250 square miles that extends on both sides of I-405 between its southern intersection with I-5 in the city of Tukwila and its northern intersection with I-5 in Snohomish County. This area includes the cities of Tukwila, Renton, Newcastle, Bellevue, Redmond, Kirkland, Woodinville, and Bothell, as well as portions of the cities of Issaquah, Kenmore, Kent, Lynnwood, and Mercer Island and adjacent unincorporated areas of King and Snohomish counties.

For purposes of environmental analysis, documentation, and review, potential substantial adverse effects are identified and evaluated wherever they are reasonably likely to occur in the region.

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2. DESCRIPTION OF ALTERNATIVES

Four programmatic action alternatives and a No Action Alternative are evaluated in this Environmental Impact Statement (EIS). Each of the four action alternatives is a combination of multi-modal transportation improvements and other mobility solutions packaged to work together as a system. Each package demonstrates a unique emphasis in response to the purpose and need for the I-405 Corridor Program. The improvements and mobility solutions that comprise each action alternative are assembled from the following major elements:

- Transportation demand management (TDM)
- Regional transportation pricing
- Local transit service (bus and other technologies)
- Bus rapid transit (BRT) operating in improved-access high-occupancy vehicle lanes on I-405, I-90, and SR 520
- Fixed-guideway high-capacity transit (HCT) operating with physical separation from other transportation modes
- Arterial high-occupancy vehicle (HOV) and bus transit priority improvements
- HOV express lanes on I-405 and HOV direct access ramps
- Park-and-ride capacity expansions
- Transit center capacity improvements
- Basic I-405 safety and operational improvements
- I-405 general purpose lanes
- I-405 collector-distributor lanes
- I-405 express lanes
- SR 167 general purpose lanes
- Capacity improvements on freeways connecting to I-405
- Planned arterial improvements
- Capacity improvements on north-south arterials
- Arterial connections to I-405
- Pedestrian and bicycle improvements
- Intelligent transportation system (ITS) improvements
- Truck freight traffic enhancements

These elements are described in greater detail in Appendix A (I-405 Corridor Program - Major Elements of Alternatives). Table 2.1 shows the system elements contained in each of the alternatives.

Table 2.1: System Elements Contained in Each Alternative

	No Action Alternative	Alternative 1 HCT/TDM Emphasis	Alternative 2 Mixed Mode with HCT/Transit Emphasis	Alternative 3 Mixed Mode Emphasis	Alternative 4 General Capacity Emphasis
Committed and funded freeway projects	X	X	X	X	X
Committed and funded HOV projects	X	X	X	X	X
Committed and funded arterial projects	X	X	X	X	X
Park–and-ride expansions included in No Action	X	X	X	X	X
Transit center improvements included in No Action	X	X	X	X	X
Transportation Demand Management (TDM)	X	X	X	X	X
Expanded TDM regional congestion pricing strategies		X			
Expand transit service by 100% compared to K. Co. 6-year plan		X	X	X	
Expand transit service by 50% compared to K. Co. 6-year plan					X
Physically separated, fixed-guideway HCT system		X	X		
Bus rapid transit operating in improved access HOV lanes				X	
Arterial HOV priority for transit		X	X	X	
HOV direct access ramps on I-405			X	X	X
Additional park-and-ride capacity expansion		X	X	X	
Additional transit center improvements		X	X	X	
Basic I-405 safety and operational improvements		X	X	X	X
I-405/ SR 167 interchange ramps for all major movements			X	X	X
One added general purpose lane in each direction on I-405			X		X
Two added general purpose lanes in each direction on I-405				X	

Table 2.1: (continued) System Elements Contained in Each Alternative

	No Action Alternative	Alternative 1 HCT/TDM Emphasis	Alternative 2 Mixed Mode with HCT/Transit Emphasis	Alternative 3 Mixed Mode Emphasis	Alternative 4 General Capacity Emphasis
Two express lanes added in each direction on I-405 [a]					X
Widen SR 167 by one lane each direction to study area boundary			X	X	X
Improved capacity of freeways connecting to I-405			X	X	X
Planned arterial improvements			X	X	X
Complete missing segments of major arterial connecting routes [b]				X	
Expand capacity on north-south arterials [b]					X
Upgrade arterial connections to I-405 [b]			X	X	X
Pedestrian / bicycle connections and crossings of I-405		X	X	X	X
Intelligent transportation system (ITS) improvements		X	X	X	X
Truck freight traffic enhancements		X	X	X	

[a] To be studied as general purpose lanes and as managed high-occupancy/toll (HOT) lanes.
[b] With jurisdictional approval.

2.1 No Action Alternative

The No Action Alternative includes the funded highway and transit capital improvement projects of cities, counties, Sound Transit, and WSDOT. These projects are already in the pipeline for implementation within the next six years, and are assumed to occur regardless of the outcome of the I-405 Corridor Program. For this reason, they are referred to collectively as the No Action Alternative.

Under the No Action Alternative, only limited expansion of state highways would occur. No expansion of I-405 is included; however, a new southbound I-405 to southbound SR 167 ramp modification would be constructed. Approximately 15 arterial widening and interchange improvement projects would be implemented within the study area by local agencies. Short-term minor construction necessary for continued operation of the existing transportation facilities would be accomplished, and minor safety improvements would be constructed as required.

It is assumed that Phase I of Sound Transit's regional transit plan would be completed. Approximately 36 HOV direct access projects, arterial HOV improvements, park-and-ride expansions, and transit center enhancements would be implemented in the study area as part of the No Action Alternative. Bus transit service levels by the 2020 horizon year are based upon the Puget Sound Regional Council (PSRC) Metropolitan Transportation Plan. A 20 percent increase in bus transit service hours above the current King County 6-year plan level is assumed by year 2020. Parking costs are expected to increase due to market forces. Additional urban centers and major employment centers within the study area are also assumed to implement parking charges by 2020.

These baseline transportation improvement projects are, or will be, the subject of separate and independent project-specific environmental analysis, documentation, and review. Their direct impacts are not specifically evaluated by the I-405 Corridor Program. However, the secondary and cumulative impacts of these projects are, addressed as part of the analyses contained herein.

Figure 2.1 shows the locations of the improvements contained in the No Action Alternative. Appendix B (I-405 Corridor Program Alternatives Project Matrix) identifies the specific transportation improvements and mobility solutions contained within each system element and alternative.

2.2 Alternative 1: High-Capacity Transit/TDM Emphasis

This alternative attempts to minimize addition of new impervious surface from general purpose transportation improvements and to encourage transit use within the study area. To do this, Alternative 1 emphasizes reliance on a new physically separated fixed-guideway HCT system, substantial expansion of local bus transit service, non-construction mobility solutions such as regional transportation pricing, and transportation demand management (TDM) strategies. It does not include any increase in roadway capacity beyond the No Action Alternative. All improvements contained in the No Action Alternative are included in Alternative 1, as well as in the other action alternatives. Table 2.1 shows the system elements contained in each of the alternatives.

Alternative 1 includes a physically separated, fixed-guideway HCT system, potentially using some form of rail technology and potentially operating within portions of the existing Burlington Northern Santa Fe (BNSF) right-of-way. The HCT system would serve the major activity centers within the study area, and would include connections to Redmond and Issaquah and west across Lake Washington to Seattle. The connection across Lake Washington is being evaluated as part of the ongoing Trans-Lake Washington Project EIS. Bus transit service would be doubled compared to the current King County 6-year plan. (The effects of recent transit reductions on short-term transit service have not been assumed.) Arterial HOV priority for transit, additional park-and-ride capacity, and additional transit center improvements also would be provided.

Legend: No Action Alternative Projects

- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Mountlake Terrace
Woodway
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Narrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Lake Sammamish
Redmond Fall City Rd
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

5 90 405 527 524 522 202 520 99 509 900 167 515 169 203 18 516

No Action Alternative

Figure No. 2.1

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A package of basic improvements to I-405 would be implemented, including climbing lanes, auxiliary lanes, I-90/Coal Creek interchange improvements, and I-405/SR 167 interchange improvements, among others. No additional general purpose lanes on I-405 would be provided.

Limited arterial HOV/transit improvements would be provided to facilitate access to I-405 and the fixed-guideway HCT system, along with non-construction treatments such as providing priority for transit at signals and intersections. Regional pricing strategies similar to those currently being studied by the Puget Sound Regional Council (PSRC) would be implemented along with a package of core TDM strategies that are common to all the action alternatives.

Figure 2.2 shows the location of improvements contained in Alternative 1. Appendix A (I-405 Corridor Program - Major Elements of Alternatives) describes the system elements that are the building blocks for the alternatives. Appendix B (I-405 Corridor Program Alternatives Project Matrix) identifies the specific transportation improvements and mobility solutions contained within each system element and alternative.

2.3 Alternative 2: Mixed Mode with High-Capacity Transit/Transit Emphasis

This alternative attempts to improve mobility options in the study area relative to Alternative 1 by providing the same substantial commitment to transit, combined with the minimum increase in roadway capacity for HOV and general purpose traffic. To do this, Alternative 2 would implement a new physically separated, fixed-guideway HCT system, substantial expansion of local bus transit service, one added lane in each direction on I-405, and improvements to connecting arterials. All improvements contained in the No Action Alternative are included in Alternative 2, as well as in the other action alternatives. Table 2.1 shows the system elements contained in each of the alternatives.

Alternative 2 includes a physically separated, fixed-guideway HCT system, potentially using some form of rail technology. The HCT system would serve the major activity centers within the study area, and would include connections to Redmond and Issaquah and west across Lake Washington to Seattle. The connection across Lake Washington is being evaluated as part of the ongoing Trans-Lake Washington Project EIS. Bus transit service would be doubled compared to the current King County 6-year plan. Arterial HOV priority for transit, additional park-and-ride capacity, and additional transit center improvements are included, as well as completion of the HOV freeway-to-freeway ramps along I-405.

To increase general purpose capacity, I-405 would be widened by one lane in each direction. One lane also would be added in each direction on SR 167 to the study area boundary. The package of basic improvements to I-405 would be implemented, along with the core TDM strategies that are common to all action alternatives. New capacity improvements on connecting arterials and freeways would be provided along with planned arterial improvements of local jurisdictions.

Figure 2.3 shows the location of improvements contained in Alternative 2. Appendix A (I-405 Corridor Program - Major Elements of Alternatives) describes the system elements for the alternatives. Appendix B (I-405 Corridor Program Alternatives Project Matrix) identifies the specific transportation improvements and mobility solutions contained within each system element and alternative.

2.4 Alternative 3: Mixed Mode Emphasis

This alternative attempts to substantially improve mobility options for all travel modes and to provide a HCT system throughout the study area at a lower cost than the physically separated, fixed-guideway system proposed in Alternatives 1 and 2. To do this, Alternative 3 would implement a new bus rapid transit (BRT) system, substantial expansion of local bus transit service, two added lanes in each direction on I-405, and improvements to arterials within the study area. All improvements contained in the No Action Alternative are included in Alternative 3, as well as in the other action alternatives. Table 2.1 shows the system elements contained in each of the alternatives.

Alternative 3 includes a BRT system operating in improved-access HOV lanes on I-405, I-90, and SR 520. The BRT system would serve the major activity centers within the study area, and would include connections to Redmond and Issaquah and west across Lake Washington to Seattle. The connection across Lake Washington is being evaluated as part of the ongoing Trans-Lake Washington Project EIS. Bus transit service would be doubled compared to the current King County 6-year plan. Improved arterial HOV priority for transit, park-and-ride capacity, transit center improvements, and HOV direct access are included, as well as completion of the HOV freeway-to-freeway ramps along I-405.

This alternative would substantially increase capacity for general purpose traffic on I-405 by adding two lanes in each direction and improving major interchanges. These added general purpose lanes replace most of the auxiliary and climbing lanes contained in the package of basic improvements to I-405 that are common to the other action alternatives. One lane would be added in each direction on SR 167 to the study area boundary. The core TDM strategies would be implemented. New capacity improvements on connecting arterials and freeways would be provided. Selected arterial missing links would be completed together with planned arterial improvements of local jurisdictions.

Figure 2.4 shows the location of improvements contained in Alternative 3. Appendix A (I-405 Corridor Program - Major Elements of Alternatives) describes the system elements for the alternatives. Appendix B (I-405 Corridor Program Alternatives Project Matrix) identifies the specific transportation improvements and mobility solutions contained within each system element and alternative.

Legend: Alternative 1: High Capacity Transit/ Transportation Demand Management (TDM) Emphasis

- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Narrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Lake Sammamish
Redmond Fall City Rd
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

5 90 527 524 522 202 405 99 520 203 509 900 169 167 515 18 516

Alternative 1: High Capacity Transit/ Transportation Demand Management (TDM) Emphasis

Figure No. 2.2

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Legend: Alternative 2: Mixed Mode with High Capacity Transit Emphasis

- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Narrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
Mercer Island
148th Ave SE
Sammamish
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

Alternative 2: Mixed Mode with High Capacity Transit Emphasis

Figure No. 2.3

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Legend: Alternative 3: Mixed Mode Emphasis

- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Mountlake Terrace
Woodway
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Hunts Point
Yarrow Point
Clyde Hill
Medina
NE 8th St
Bellevue
Lake Sammamish
Redmond Fall City Rd
Seattle
Beaux Arts
Mercer Island
148th Ave SE
Sammamish
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

Alternative 3: Mixed Mode Emphasis

Figure No. 2.4

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2.5 Alternative 4: General Capacity Emphasis

This alternative places the greatest emphasis on increasing general purpose and HOV roadway capacity, with substantially less reliance on new transit facilities or added local bus service than any of the other action alternatives. To do this, Alternative 4 would provide one additional lane in each direction on I-405, a new four-lane I-405 express roadway, and the other general purpose and HOV roadway improvements on I-405 and connecting freeways contained in Alternative 3. The expansion of local bus transit service would be about half that proposed under the other action alternatives. All improvements contained in the No Action Alternative are included in Alternative 4, as well as in the other action alternatives. Table 2.1 shows the system elements contained in each of the alternatives.

Alternative 4 would expand freeway capacity by adding one additional general purpose lane in each direction on I-405 in most segments, improving major interchanges, and constructing a new four-lane I-405 express roadway consisting of two lanes in each direction with limited access points. Completion of the HOV freeway-to-freeway ramps along I-405 and the package of basic improvements to I-405 would be implemented.

Arterial improvements would include additional expansion of major arterial routes and connections to I-405 in conjunction with the planned arterial improvements of local jurisdictions. Transit in this alternative is assumed to be a continuation of the existing local and express bus transit system with a 50 percent increase in service compared to the current King County 6-year plan. Park-and-ride capacity would be provided along with the core TDM strategies that are common to all action alternatives.

Figure 2.5 shows the location of improvements contained in Alternative 4. Appendix A (I-405 Corridor Program - Major Elements of Alternatives) describes the system elements for the alternatives. Appendix B (I-405 Corridor Program Alternatives Project Matrix) identifies the specific transportation improvements and mobility solutions contained within each system element and alternative.

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Legend: Alternative 4: General Capacity Emphasis

- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

SNOHOMISH

KING

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Yarrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
Mercer Island
148th Ave SE
Sammamish
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

Alternative 4: General Capacity Emphasis

Figure No. 2.5

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3. METHODOLOGY AND COORDINATION

This section of the Report outlines the methodology used to evaluate impacts to wetlands from the project alternatives.

3.1 Evaluation Measures and Data Sources

Wetland data were evaluated using a variety of federal, state, regional, and local sources. Digital GIS information was available from the National Wetlands Inventory (NWI, 1993). Existing digital data are represented in Figure 3.1. This primary source was supplemented using the following reference materials:

- SR 405 HOV Lanes – Bothell to Swamp Creek Environmental Analysis (DEA, 1996)
- Snohomish County Stream and Wetland Inventory (1987)
- King County Sensitive Areas Map Folio (1990)
- City of Bothell Critical Areas Map (1990)
- City of Kirkland Streams, Wetlands, and Wildlife Study (1998)
- City of Redmond Sensitive Areas Map (1997)
- City of Bellevue Sensitive Areas Notebook (1987)
- City of Kent Wetland Inventory Report (1990)
- City of Renton Wildlife Corridor Study (1994)

Additional cities were consulted to determine the nature and extent of wetlands within their jurisdictions. These cities include:

- City of Tukwila
- City of Kenmore
- City of Mountlake Terrace
- City of Woodinville
- City of Newcastle

Aerial photographs of November 1, 1999, conditions were available for most of the SR 405 corridor. They were consulted to identify wetland resources absent for local inventories. These absent wetland resources were added to the wetland data set. However, secondary resources such as maps and aerial photographs tend to greatly underestimate wetland acreage and are general in their estimation of wetland type and function.

3.2 Approach to Analyses

Wetland resources from the above sources were compiled onto one set of 1"=1,600' maps. Preliminary project engineering plans were then overlain onto the composite wetland resources map. Projects were identified as having potential wetland impacts when any portion of the road prism or other potential improvements overlapped the wetland boundary. This approach provided a conservative estimate of wetland impacts because some bridge projects would actually span wetland areas rather than fill them.

The total number of wetlands (or portion of wetlands) potentially filled and the number of High Priority wetlands potentially filled were tallied. Acreage from the potentially filled wetland areas was estimated from the project engineering plans to the nearest 0.1 acre wherever possible. A spreadsheet program was then used to sum the individual projects by transportation element and these estimates are provided in the working papers, and are discussed below. No fieldwork was conducted for this analysis.

To effectively analyze wetland impacts, a system of classifying wetlands that provide high biological and hydrological values was created. Most jurisdictions along the I-405 corridor classify these higher-value wetlands as Category 1 or 2. Because no single classification system exists for all wetlands in the corridor, a "priority" ranking system was used. Wetlands were designated as either High Priority (HP) or Priority (LP). HP wetlands included all wetlands in the highest category defined by any jurisdiction or agency (Table 3.1 and includes additional criteria listed below. For example, any wetland in Redmond classified as Category 1 by the City of Redmond was considered HP, as was any wetland meeting additional criteria. Criteria used to define HP and LP were as follows:

- **High Priority Wetlands** are those wetlands that are identified by any jurisdiction in the study area as Category 1 or similar rating of the highest value (Table 3.1). In addition, any wetland is included that contains endangered or threatened species within habitat polygons, indicated in the Priority Habitat and Species (PHS) and Streamnet databases; is located within 0.5 miles of a T&E species point; is in close proximity to streams with T&E or candidate species; or is greater than one acre is size. These criteria were employed to ensure that all wetlands with difficult or impossible to replace functions were recognized.
- **Lower Priority Wetlands** are all wetlands not rated as High Priority. Because these wetlands have lower values, protection and mitigation requirements might be less stringent than those for HP wetlands. They may, however, still provide important functions and be subject to permitting and other regulations. In particular, LP wetlands classified as "404" by the US Army Corp of Engineers (USACE) are subject to a USACE permitting process.

Because additional HP criteria are broad, many wetlands classified at lower levels by jurisdictions are considered HP in this analysis. This system ensures that all high quality wetlands, including both those designated by agencies and jurisdictions and those that may not meet local criteria but are still of high value, are given HP status. Section 404 of the Clean Water Act defines wetlands, without classifying them, based on vegetation, soils and hydrology. Section 404 wetlands are defined as having a prevalence of hydrophytic vegetation, hydric soils, and certain hydrological indicators. By this definition, all HP and LP wetlands would likely be 404 wetlands.

Table 3-1:
High Priority Wetland Criteria by Jurisdiction

	ECOLOGY	KING COUNTY	SNOHOMISH COUNTY	REDMOND	TUKWILA	RENTON	BOTHELL	KENMORE	KENT	WOODINVILLE	KIRKLAND	NEWCASTLE	BELLEVUE
HIGHEST CLASSIFICATION CRITERIA BY JURISDICTION													
Type A - All wetlands related by surface hydrology to a Type A or B riparian corridor.													✍
Presence of T&E species	✍	✍		✍	✍	✍	✍	✍	✍	✍	✍	✍	
Critical or outstanding T&E habitat		✍		✍	✍	✍	✍	✍	✍	✍	✍	✍	
Priority or Sensitive Species present				✍			✍		✍				
WA Natural Heritage Program high quality native wetland	✍								✍			✍	
DNR Heritage Quality Wetland													
Bogs or fens	✍		✍									✍	
Estuarine wetlands or mature forested wetlands	✍		✍									✍	
Plant associations of infrequent occurrence		✍		✍		✍	✍	✍		✍			
No non-native plant populations	✍												
Regionally significant waterfowl or shorebird concentration area			✍										
Locally significant ('exceptional significance' or 'unique & fragile')	✍											✍	
40%-60% open water in dispersed patches w/ = 2 wetland veg. classes		✍		✍	✍	✍	✍	✍	c ✍	✍			
= 10 acres w/ = 3 wetland veg. classes (one of which can be open water)		✍	✍			✍	✍	✍	✍	✍	✍		
= 5 acres w/ = 3 wetland veg. classes					✍								
= 3 wetland classes each over 10% of total area			✍										
= 2 wetland classes		✍						✍					
No sig. human-caused degradation	✍												
= 1/4 acre of organic soils (peat or mucky soils)										✍			
Unique/outstanding #1 rating in King Co. Wetlands Inventory						a ✍				b ✍			
Hydrologically connected			✍										
Contiguous w/ Lake Washington										✍			
ADDITIONAL CRITERIA USED IN THIS ANALYSIS REGARDLESS OF JURISDICTION													
T&E species within habitat polygons (indicated on PHS and Streamnet databases)													
Any wetland located within 0.5 mile of T&E species point													
Any wetland in close proximity to streams with T&E or candidate species													
All wetlands 1 acre or more													

[a] based on 1991 ("or most current") inventory

[b] based on 1983 inventory

[c] (slight language difference: = 2 acres having 40% - 60% and = 2 veg. classes.)

Note: Mountlake Terrace has no categorization criteria but uses SEPA process

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Legend: Existing Wetlands in the Study Area

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
SNOHOMISH
KING
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Yarrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Lake Sammamish
Redmond Fall City Rd
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Covington
Maple Valley
Auburn
Federal Way

Existing Wetlands in the Study Area

Figure No. 3.1

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Project design was used to estimate potential impacts. However, the level of design available is conceptual at this time. In general, potential wetland impact acreage estimates are commensurate with the level of engineering design available. In many circumstances, design information for HCT elements was less detailed than design information for roads and/or road widening. This disparity in the level of detail available led to differences in the level of precision presented in wetland impacts. For instance, along HCT alignments the level of detail available allowed for estimates to the nearest acre, while engineering design for a turn lane added to an existing road may have allowed for impact estimates as precise as 0.1 acre. In cases where planned HCT sections are to be elevated, no impact was recorded, although the assumption was made that some piers may be located in wetlands or buffers.

Potential opportunities for avoidance were identified. Best professional judgement was used to determine the feasibility of using slight shifts within existing ROW to avoid wetlands or the use of retaining walls and other engineering tools to avoid wetland impacts. For some types of projects, such as HCT along new alignments, the feasibility of altering track alignments to avoid wetland resources was also evaluated. Additional engineering solutions for wetland avoidance and minimization may be available (e.g., bridging). However, these options are beyond a corridor level analysis. Opportunities for utilizing these avoidance and minimization strategies would be evaluated at the project level. Some typical avoidance measures to be contemplated include:

- using or lengthening bridges to cross streams and their associated riparian corridors and wetlands;
- using retaining walls to reduce or eliminate lateral extensions of road embankment slopes into wetlands;
- using guardrails to increase the grade of embankments, and avoid wetland fill;
- stacking or constructing viaducts;
- constructing tunnels; and
- using buried stormwater detention facilities to avoid placement in wetlands or wetland buffers.

The level of design available does not allow for the analysis of most of these techniques. However, the project-level design will consider all appropriate technologies to minimize wetland impacts.

3.3 Coordination with Agencies and Jurisdictions

David Evans and Associates, Inc. (DEA) wetland biologists contacted resource agencies, including the U.S. Army Corps of Engineers (USACOE), Washington State Department of Fish and Wildlife (WDFW), Washington State Department of Ecology (Ecology), U.S. Department of Interior Fish and Wildlife Service (USFWS), and U.S. Department of Commerce National Marine Fisheries Service (NMFS), to discuss methodologies and strategies for impact assessment, avoidance, and minimization.

3.4 Plans, Policies, and Approvals

The wetland impact analyst consulted the following guiding plans and policies to ensure consistency with state, local and federal requirements:

- Clean Water Act (1972)
- WSDOT and WDFW Memorandum of Agreement Implementing Wetlands Protection and Management (1993)
- Alternative Mitigation Policy Guidance, Ecology and WDFW (2000)
- Working Agreement between the USACOE, Federal Highway Administration, and WSDOT (1993)
- State Shoreline Management Act (1972)
- Executive Order 11970, Protection of Wetlands
- Local critical or sensitive area regulations for wetlands and streams

Although local regulations were consulted, they vary in their mitigation requirements. Some low value Category IV wetlands can have their functions relatively easily replaced and a 1:1 mitigation ratio is appropriate. For some high quality systems such as organic soil bogs or fens, mitigation is impossible or should occur at ratios up to or more than 6:1. Because exact mitigation locations and strategies are not possible until a project specific function and value impact analysis has been conducted, these varying mitigation requirements have not been incorporated into the suggested mitigation options described in this document.

4. AFFECTED ENVIRONMENT

Wetlands provide a number of functions and values in the biological, hydrological, and societal landscape. Wetland functions are characteristic to some degree of all wetlands, and while they may be considered in defining classification criteria they are not themselves criteria. The measures used in this study to designate HP wetlands are discussed below. Within the study area, wetlands provide essential habitat for threatened and endangered plants and animals, as well as species with other special status.

Wetlands serve to store both surface and subsurface water. This storage can reduce peak water flow after a storm or flood, recharge water tables and aquifers, and lengthen stream flow period. Because of their landscape geomorphic position and adapted vegetation, many wetlands are particularly adapted to attenuating stormwater pulses. Wetlands can remove pollutants such as zinc, lead, nitrogen, phosphorus, and some organic contaminants. The ability to treat stormwater is highly site-specific, depending greatly upon soil type, hydrologic regime, and vegetative community (see *I-405 Corridor Program Draft Surface Water Resources Expertise Report* [CH2M HILL, 2001] and *I-405 Corridor Program Draft Floodplain Expertise Report* [DEA, 2001]).

High Priority wetlands functions include:

- Providing perching, foraging, and/or buffer habitat for wildlife species with State or USFWS Threatened or Endangered Species status, specifically bald eagle (*Haliaeetus leucocephalus*) and Oregon spotted frog (*Rana pretiosa*), although it is extremely unlikely that the latter is present in the study area.
- Providing habitat for State and USFWS Species of Concern and Priority Species, including wood duck (*Aix sponsa*), mink (*Mustela vison*), and western toad (*Bufo boreas*);
- Providing habitat buffers for fish species with State or USFWS status, including Puget Sound chinook (*Oncorhynchus tshawytscha*), bull trout (*Salvelinus confluentus*), and Puget Sound/Strait of Georgia coho salmon (*O. kisutch*) (see *I-405 Corridor Program Draft Fish and Aquatic Habitat Expertise Report* [DEA, 2001];
- Providing breeding or foraging habitat for common wetland species such as Canada goose (*Branta canadensis*), pied-billed grebe (*Podikymbus podiceps*), American coot (*Fulica americana*), spotted sandpiper (*Actitis macularia*), belted kingfisher (*Ceryle alcyon*), marsh wren (*Cistothorus palustris*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), several dabbling duck species (*Anas* spp.), vagrant shrew (*Sorex vagrans*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), and northwestern salamander (*Ambystoma macrodactylum*);
- Providing resting or feeding habitat for migrating birds, including waterfowl and shorebirds;
- Supporting threatened and endangered plant species such as marsh-sandwort (*Arenaria paludicola*), water howellia (*Howellia aquatilis*), and Ute ladies' tresses (*Spiranthes divulialis*), although no threatened or endangered plant species are known or likely to occur in the study area;
- Providing habitat for native plant species;
- Removing sediment, nutrients, and contaminants from surface water;

- Reducing peak flows and storing flood waters; and
- Recharging groundwater.

Lower Priority wetland functions include:

- Providing habitat for common wetlands-associated wildlife species;
- Reducing peak flows and storing flood waters; and
- Removing sediment, nutrients, and contaminants.

Analyzing HP wetlands, as well as total wetlands, is important because HP wetlands would need to be avoided as much as possible while LP wetlands may provide better opportunities for mitigation. Lower Priority wetlands are scattered throughout the study area. In general, HP wetlands in the study area are predominately located near stream corridors in:

- Redmond (east of SR 202 and northwest of Lake Sammamish);
- Woodinville (east of I-405 and north of SR 522);
- Bellevue (just west of I-405); and
- Kent (large, scattered wetlands east of I-5 to Kent Valley).

Wetland buffers are required in most jurisdictions within the study area, and at WSDOT mitigation sites. Buffers help maintain wetland functions and values by limiting many of the typical wetland alterations listed above. Because buffer effectiveness depends upon the nature of the buffer, the specific wetland function or value being protected, and the potential alteration, buffer effectiveness is difficult to quantify. Many of the wetland buffers adjacent to the existing highways, arterials, and railroad right-of-way (ROW) are mowed or otherwise altered. Many of the wetland fill acreage discussed in this report consist of lateral extensions of an existing, mowed, road shoulder's toe-of-slope into a wetland.

Because buffer functionality varies substantially and is currently not quantified in any local inventory, impacts to buffer functions are not discussed in this report. Although buffer functions and impacts will be analyzed at the project level, for the purposes of this programmatic assessment, buffer impacts are assumed to be correlated with total wetland acreage potentially impacted.

4.1 Regional Environment

4.1.1 Vegetation

The general vegetation characteristics bordering the project vary greatly. Many areas in the project study area are composed of relatively undisturbed, native vegetation. Typical examples of zones with limited historic human alteration or intrusion include Mercer Slough natural area, wetland complexes at the northern end of Lake Sammamish, floodplain associated wetlands along the Green River, and large forested wetland complexes associated with Soos Creek in East King County. Many of these wetland areas were inventoried by King County as Category 1 wetlands. Because the local inventory listed these areas as Category 1, they were automatically placed in the HP category for the purposes of this analysis. Typical vegetation for large, relatively undisturbed

wetlands includes: willows (*Salix* spp.), sedges (*Carex* spp.), western red cedar (*Thuja plicata*), red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*), and salmonberry (*Rubus spectabilis*). These plant species are native to western Washington.

Many wetlands in the study area are typified by disturbed conditions. These include presence of exotic species, roadside drainages, and smaller urban wetlands. These wetlands are typically inventoried as Category 3 or 4 by local jurisdictions and thus would be considered LP Wetlands. In these often urban wetlands, typical vegetation includes: reed canarygrass (*Phalaris arundinacea*), blackberries (*Rubus* spp.), soft rush (*Juncus effusus*), cattail (*Typha latifolia*), hardhack (*Spiraea douglasii*), willows, and horsetail (*Equisetum* spp.).

Vegetation across the study area presents a continuum from near historic pre-European colonization, native conditions, to highly degraded wetlands vegetated solely by invasive or exotic species. The more degraded vegetation communities present fewer opportunities for wildlife and general biological support. The highly degraded vegetation communities have values for stormwater treatment and for other hydrologic functions.

Discussion regarding the character of upland communities, including wetland buffers, can be found in the *I-405 Corridor Program Draft Upland Vegetation, Habitat, and Wildlife Expertise Report* (DEA, 2001).

4.1.2 Soils

The soil series associations crossed by this project are broadly divided into two general groups; those more frequently associated with wetlands and streams and those that are predominantly upland. Information for these soils was taken from the Soil Survey of Snohomish County (U.S. Department of Agriculture Soil Conservation Service 1983) and the Soil Survey for King County Area (U.S. Department of Agriculture Soil Conservation Service 1973). Study-area-specific information was used to develop the association of soil types with wetlands, through a comparison of the wetland database maps and the Soil Surveys.

Hydric Soils. The first group of soils can be further divided into soils generally expected to contain wetlands (listed as hydric), and those that may occasionally contain wetlands, but just as often may not (non-hydric) (Table 4.1). (See also the *I-405 Corridor Program Draft Geology and Soils Expertise Report* [CH2M HILL, 2001]). Hydric soils are "formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (NRCS 1998). The soils which are listed as hydric by the National Technical Committee on Hydric Soils (NTCHS) and crossed by the projects are predominantly silt loams, silty clay loams, mucks and riverwash. In general, these soils are found in depressional areas or floodplains, are deep, and are poorly drained. Runoff is generally slow for most soils, the hazard of water erosion is slight, and a seasonal high water table or ponding in these areas is common. The exception is riverwash, a hydric soil that is somewhat excessively drained, although subject to frequent flooding. Overflow and alteration by severe erosion and deposition are frequent.

Table 4.1: Hydric and Non-Hydric Soils With Wetlands, and Soils Without Wetlands within the I-405 Study Area

Hydric Soils	Non-hydric Soils	Soils without wetlands
Briscot silt loam	Alderwood gravelly sandy loam, 6 to 15 percent slopes	Alderwood and Kitsap soils, very steep
Custer fine sandy loam	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Arents, Alderwood material, 0 to 6 percent slopes
Earlmont silt loam	Indianola loamy fine sand, 4 to 15 percent slopes	Arents, Alderwood material, 6 to 15 percent slopes
Norma sandy loam	Kitsap silt loam, 2 to 8 percent slopes	Alderwood gravelly sandy loam, 0 to 6 percent slopes
Oridia silt loam	Urban land.	Beausite gravelly sandy loam, 6 to 15 percent slopes
Puget silty clay loam		Beausite gravelly sandy loam, 15 to 30 percent slopes
Riverwash		Everett gravelly sandy loam, 0 to 5 percent slopes
Shalcar muck		Everett gravelly sandy loam, 5 to 15 percent slopes
Snohomish silt loam, thick surface variant		Indianola loamy fine sand, 0 to 4 percent slopes
Tukwila muck		Kitsap silt loam, 0 to 8 percent slopes
Mukilteo muck		Kitsap silt loam, 8 to 15 percent slopes
Woodinville silt loam		Kitsap silt loam, 15 to 30 percent slopes
		Lynnwood loamy sand 0 to 3 percent slopes
		Mixed alluvial land
		Newberg silt loam
		Nooksack silt loam
		Puyallup fine sandy loam
		Ragnar-Indianola association

Some soils, although not listed as hydric by the NTCHS, are occasionally mapped as containing wetland areas in the vicinity of the project and thus are included in Table 4.1. These soils are predominantly gravelly sandy loams, generally found on till plains, terraces and outwash plains. They are moderately deep over a hardpan and moderately well drained. A seasonal perched water table is at a depth of 18 to 36 inches from January to March. Springs or seep areas are common.

Non- hydric Soils. The second group of soils crossed by the project and characterized by upland vegetation and lack of wetlands, are predominantly gravelly sandy loams, found on terraces and outwash plains. Also crossed by the project are silt loams, which are generally poorly drained, with seasonal high water tables and flood hazard potential; a fine sandy loam, often encountered along stream terraces, with a seasonal high water table and flood hazard potential; and a loamy fine sand and mixed alluvial land. While these soil types may be found in wetland areas outside of the study area, within the study area, wetlands were only rarely mapped in association with these soil types.

Soils without Wetlands. The project area also includes urban land and areas where the surface layer, subsoil, and substratum have been greatly disturbed, removed or replaced with other soil material. The I-405 and other roadway prisms are, in most areas, composed of imported fill. Inventoried and mapped wetlands are rare in fill. However,

jurisdictional wetlands may occur in association with otherwise non-jurisdictional roadside drainage ditches.

This section only discusses the relationship of soils in the study area to wetland resources. Soils data was generally reviewed but was not used to determine or rank wetlands. Additional discussion regarding geology, soils, and soil morphology may be found in the *I-405 Corridor Program Draft Geology and Soils Expertise Report* (CH2M HILL, 2001).

4.1.3 Hydrology

Wetland hydrology varies greatly throughout the study area. In general, two types of wetland hydrology exist. Hydroperiod and water source are most common.

The first type of wetland persists due to a combination of topography, landscape position, and soil type. Many low flat floodplains adjacent to the Green River, Cedar River, Sammamish River, Soos Creek, and North Creek contain wetlands. These areas have intermittent hydroperiods, with frequent saturation due to regional run-off from winter rains. These areas may or may not remain saturated during the late summer months. The hydrology of these wetlands has likely been altered slightly due to increases in impervious surface and decreases in forest cover upstream. Flood pulses reach these systems faster and carry higher sediment loads as well. Regionally, these effects have reduced the fisheries and habitat potential of these wetland types, although many productive, high quality systems remain. Wetlands with the floodplain type hydroperiod oftentimes provide considerable flood storage and water quality improvement when not converted to agriculture uses.

The second type of wetland persists due to seasonal or permanent seepage of groundwater. Steep slopes with groundwater seeps located west of the Sammamish River, in the vicinity of Kelsey and May creeks and along other stream courses in the analysis area, typify these conditions. Groundwater saturates soils in these areas, either seasonally or permanently. These groundwater discharges are dependent upon up-gradient infiltration and recharge. The flow may slow or stop during periods of low groundwater recharge in late summer. Increases in impervious surface within the catchment have probably altered the hydroperiod in some of these wetland complexes. However, because knowledge of predevelopment groundwater hydrology in these areas is limited, quantifying changes is problematic.

This generalization has not attempted to describe all the relationships of hydrology to the study area. Additional information regarding the surface and groundwater resources of the study area may be found in the I-405 Corridor Program Draft Surface Water Resources and Groundwater Resources Expertise Reports (CH2M HILL, 2001).

4.1.4 Topography

Topography varies widely throughout the study area. As discussed above, topography constrains some wetland resources, but steep slopes, in addition to low gradient (flat) floodplains, may contain wetlands.

Wetlands found on moderate to steep slopes are typified by gravelly sandy alluvial soils and groundwater seepage. They rely upon pervious up-gradient surfaces to recharge subsurface hydrology. During particularly wet conditions, subsurface hydrology may lubricate soils sufficiently to initiate landslides and mass wasting. Wetlands on steep slopes are thus frequently erosion hazard areas as well.

Wetlands found on gentle gradients and valley bottoms are typified by silty and organic soils. Their hydrology is often due to ponding during winter rains and/or seasonal flooding. Many areas within the 100-year floodplains are wetlands with seasonally saturated conditions.

Additional information regarding the relationships of wetlands and uplands to topography and geomorphic position in the landscape may be found in the *I-405 Corridor Program Draft Geology and Soils Expertise Report* (CH2M HILL, 2001). The I-405 Corridor Program Draft Floodplain and Shorelines Expertise Reports (DEA, 2001) also discuss topographic features within the study area as they potentially relate to wetland resources.

4.2 Wetland Categories and Ranking

Of the approximately 740 wetlands in the study area, 190 are considered HP wetlands. The remainder is considered LP. (See description of ranking in the Methodology Section 3.2) Thousands more wetlands likely exist within the study area but area distant from proposed transportation alternatives.

5. IMPACT ANALYSIS

For the purposes of the following analysis, wetland impacts are discussed by alternative and by transportation element. Wetland resources potentially impacted by the individual project types are recorded in Appendix D. Wetland fill acreage for each project was estimated to the nearest 0.1 acre. However, wetland fill acreage for each transportation element was rounded to the nearest acre. Wetland impact acreage for the entire alternative may not add exactly due to rounding.

The ability to quantify impacts of the proposed projects on wetlands is limited at the programmatic level and therefore any impact must be considered "potential." However, impacts can be estimated and comparisons made among the alternatives. This level of analysis is consistent with the level of design available and the objectives of a programmatic EIS. Some projects lacked location information (e.g., many park-and-ride lots). The potential wetland impacts associated with these projects were not quantified. Because detailed designed plans are not yet available, acreage impacts are estimates and, while they are useful for comparisons among alternatives, they cannot be accurately determined for each type of transportation improvement. The number of wetlands impacted is used for comparison purposes, since the extent of the impact could only be estimated at the programmatic level. Some wetlands might be entirely filled, while others might be only marginally affected.

Wetlands are sensitive resources, and their functions and values may be adversely impacted by hydrologic alterations, sediment or pollutant loads, fragmentation, invasive species introductions, or filling and grading. Typical potential impacts to wetlands are discussed below for each alternative. Potential impacts can be described as follows:

- Hydrologic impacts are those that alter the hydrology of the wetland so that species of plants and animals, and therefore the use of the wetland, might be affected.
- Water quality impacts are those from sediments and other pollutants produced from construction or from operation of transportation improvement that could cause detrimental effects to wetland species.
- Habitat fragmentation can interfere with plant and animal migration, precipitate invasion by unwanted plants and animal pest species, and increase the frequency of wildlife-vehicle collisions. New roads have the greatest potential to fragment wetlands. Road widening has a dramatically lower potential to fragment wetland resources, principally because wetland filling would occur adjacent to the existing roadway prism.

Some of these impacts may be avoidable or minimized through engineering design refinements. All appropriate strategies would be pursued during project-level design. Design refinements that might be employed include bridging of wetlands, retaining walls, temporary fencing and flagging of wetlands to restrict the intrusion of construction equipment into wetlands and work area buffers. Design refinements that will be used during construction include bridging and retaining walls, temporary fencing to restrict the intrusion of construction equipment into wetlands, work area buffers, check dams, temporary seeding, mulching, jute netting, phased construction, and construction during less sensitive seasons. All appropriate avoidance and minimization strategies will be pursued during project-level design.

Project design would need to incorporate storm drainage features to ensure that contaminants and sediments are controlled. Best management practices (BMPs) would be required to minimize short-term noise, sedimentation, and contamination. These practices may include procedures such as sediment fences, check dams, temporary seeding, mulching, jute netting, phased construction, and construction during less sensitive seasons. While BMPs can reduce the impact of sediment, oils, and greases, having disturbed ground with heavy construction equipment present typically leads to increased inputs of these constituents to wetlands and drainages. While best available technology would be used and construction would be staged to occur during dry periods, there exists the potential for erosion control or drainage system failure. Stormwater treatment facilities would be designed to meet Ecology, local, and / or WSDOT standards

■

5.1 No Action Alternative

The No Action Alternative includes 54 projects, which potentially impact 57 wetlands including 19 HP wetlands (Table 5.1), totaling approximately 12 acres of impact within the study area (Figure 5.1). The total area of wetland fill associated with arterial committed projects would be approximately 10.7 acres. Under this alternative, committed freeway projects and arterial interchange improvements would fill no wetlands. Committed HOV Projects would fill portions of 20 wetlands, two of which are HP systems. The total wetland fill area associated with this transportation element is 0.7 acres. Because the committed HOV projects follow existing roads, and wetland resources often extend up to the base of the roadway prism, opportunities for avoiding these wetlands are limited. Committed arterial projects would impact the greatest number of wetlands of all project types in this alternative. Arterial committed projects would affect 37 wetlands, 17 of which are HP systems.

Table 5.1: No Action Alternative Impacts

Types of Improvements	Total Wetlands Potentially Impacted	High Priority Wetlands Potentially impacted
Committed Freeway	0	0
Arterial Interchanges	0	0
Committed HOV	20	2
Park & Ride	unknown	
Arterial Committed	37	17

5.1.1 Construction Impacts

Construction associated with the No Action Alternative would potentially have direct, short-term impacts on approximately 12 acres of wetlands. About 11 acres are associated with the arterial committed projects.

Legend: No Action Alternative Projects with Wetlands

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative would be implemented as part of each action alternative.

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Yarrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

No Action Alternative Projects with Wetlands

Figure No. 5.1

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Habitat fragmentation is a potential direct impact from construction; however, because no new roads are proposed in this alternative, the potential for this alternative to fragment wetland habitat is low.

Short-term impacts due to sedimentation, contamination, and the presence of construction crews and machinery are possible. Increases in human activity and construction can disturb wildlife and alter nesting and breeding behaviors. Short-term increases in sediment and/or pollutant loads may occur during construction, and this may temporarily lessen a wetland's ability to filter sediment and contaminants. Sediment increases are often due to changes in run-off patterns associated with disturbed ground (See *I-405 Corridor Program Draft Surface Water Resources Expertise Report* [CH2M HILL, 2001]).

5.1.2 Operational Impacts

Permanent increases in impervious surface would likely lead to some degradation of wetlands from associated increases in sediment and contaminant loads due to runoff. Because the No Action Alternative includes a 164-acre increase in impervious surface, some impacts are possible. However, this alternative results in the lowest increase in impervious surface of all the alternatives. In addition, there are currently 37 detention facilities, 12 water quality facilities, and 7 combined facilities in the I-405 corridor area that would assist in reducing the impacts (CH2M HILL, 2001b).

Similarly, while a substantial loss of wetland area would occur under the No Action Alternative, it is a substantially smaller area than that to be filled under Alternatives 2, 3, and 4. Net loss of wetland area would lead to a permanent loss of the functions associated with wetlands, and even mitigation can result in temporary losses of functions (see Section 5.1.5). Changes to or loss of buffers may also affect wetlands and associated wildlife by removing disturbance and contamination barriers. Some wetland wildlife species also commonly use buffers for feeding or moving. Transportation improvements may alter wetland buffers when existing roads are widened, new roads are constructed, or when new transit alignments are designed.

Potential operational impacts of the proposed projects include increased noise and vehicular traffic, sedimentation, contamination, and changes in runoff pulse and timing. Increased noise due to increased roadway capacity could permanently disturb or deter wildlife from proximate wetlands, thereby lowering the wetland's habitat value. However, new roads and transportation infrastructure generally create more new noise than improvements to existing roads. Because new roads or transit systems are not proposed under the No Action Alternative, the noise impacts from this alternative would be relatively slight. Further discussion of noise impacts may be found in the *I-405 Corridor Program Draft Noise Expertise Report* (Parsons Brinkerhoff, 2001).

Potential effects to wetland functions caused by increased sedimentation and contamination are the same as those listed in Section 5.1.1, and while increases in these parameters may be less acute in the long term than during construction, they could be exacerbated by accidents, leaks, or spills on roadways. However, retrofitting of existing facilities could occur in conjunction with many of the future projects, and this would help offset some of these potential water quality impacts. Pollutant loading and overall impact to surface water from the improvements was judged in the *I-405 Corridor Program Draft Surface Water Expertise Report* (CH2M HILL, 2001) to be below the threshold of

significance. Further discussion of the potential impacts to water resources may be found in the *I-405 Corridor Program Draft Surface Water Resources Report* and *Groundwater Resources Expertise Report* (CH2M HILL, 2001).

Wetland hydrology may be altered through the placement of fill and the reduction of storage volume, through changes in permeable surface area, or through rerouting of "feeding" water. Project level design would consider existing inundation and flooding patterns to ensure projects avoid altering wetland hydrology. Increases in impervious surface may alter groundwater hydrologic regimes within the study area. Project level drainage design would need provisions to provide comparable infiltration rates and volumes when appropriate.

Impervious surface would increase by 164 acres under this alternative. While this increase would require storm drainage mitigation to avoid downstream impacts to wetlands, it is the lowest increase in impervious surface of any alternative. Potential impacts to hydrology associated with these surfaces are consequently lowest for the No Action Alternative.

5.1.3 Mitigation Measures

General Mitigation. Because wetland functions generally vary between HP and LP wetlands, mitigation needs also vary. HP wetlands would require higher mitigation ratios than lower quality wetlands. Constructing mitigation prior to wetland disturbance may help minimize temporary losses of wetland functions, although it may take 10 or more years for wetlands to mature enough to replace functions. While wetlands within the study area may not provide all of their historic functions, they remain a valuable and sometimes irreplaceable resource.

Frequently, the relationship between wetland area and habitat value is non-linear. Thus, the impact of filling, for instance, 10 percent of any particular wetland could vary depending on the size and quality of the original wetland, the relationship of the mitigation to the original wetland, and the surrounding habitat. Wetland mitigation sites frequently have initially lower habitat values than natural systems, as some wetlands may take 80 or more years to reach maturity and provide their full functions. Wetland mitigation often occurs at a ratio to compensate for this inequality. Mitigation ratios vary by jurisdiction, responsible agency, and construction-impact timing. They range from 1:1 to 6:1 or more. Should wetland mitigation use generic ratios rather than functional assessment strategies, mitigation sites may not provide the same functions and values as those destroyed. Project level design would consider these factors in order that the appropriate mitigation decisions are made. Mitigation would be constructed where feasible prior to wetland impacts to reduce temporary losses of wetland functions.

Regional wetland mitigation facilities may have the potential to improve many of these functions, particularly fish-rearing habitat, peak flow attenuation, large habitat areas with limited disturbance and edge area, and low flow augmentation. Because of the typically large number of small wetland impacts associated with linear transportation projects, there may exist the opportunity for regional wetland restoration or enhancement. However, the specific functions appropriate for restoration and/or enhancement would depend upon the particular mix of transportation elements and projects chosen as the preferred alternative. Combining such impacts into a few regional restoration projects

may not be practicable. Opportunities for restoration are highly site-specific, depending greatly upon the functions provided by the existing watershed conditions, and thus specific parcels for wetland restoration or mitigation have not been identified.

The analysis assumes that sufficient property is available within the project area for mitigation. In some highly developed watersheds, suitable vacant parcels available for mitigation may be rare. Identification of available parcels for mitigation would be dependent upon specific real estate conditions and would be undertaken during project-level analysis.

This early analysis assumes that avoiding wetlands altogether is the first step in the mitigation process. Project level impact analysis would evaluate whether some operational impacts could be mitigated. For instance, noise could be mitigated through screening nearby wetlands. Project level design would also ensure that an increase in impervious surfaces and increased stormwater runoff does not alter wetland hydrology in downstream reaches.

Specific No Action Mitigation. Approximately 12 acres of wetland would be filled and would require mitigation under this alternative. Wetland mitigation sites would have to be found within each watershed and preferably in proximity to the filled area. Mitigation sites should provide connectivity with the remaining wetlands within the basin whenever possible, although isolated wetlands in highly developed areas are not without value, as they provide habitat for urban wildlife. In some instances, out-of-kind watershed restoration may provide adequate or even higher levels of wetland/watershed functions than in-kind wetland replacement. While out-of-kind restoration is an alternative mitigation measure, its value would be assessed on a case-by-case basis. Because this alternative potentially impacts the fewest numbers of wetlands and the least wetland acreage, the need for out-of-kind mitigation is consequently the lowest.

5.2 Alternative 1: HCT/TDM Emphasis

The HCT/TDM alternative includes 109 projects, which potentially impact 81 wetlands within the study area, including 34 HP wetlands (Figure 5.2, Table 5.2). Total wetland area filled under this alternative would be approximately 13 acres. All impacts are in addition to the 12 acres affected by the No Action Alternative. Under this alternative, basic I-405 improvement projects fill six wetlands, two of which are HP systems. Arterial HOV projects would affect 16 wetlands, nine of which are HP systems. Construction activities associated with freight and ITS improvements are minimal, and only interchange improvements to I-405/SR 167 would potentially impact wetlands. High-capacity transit would impact 45 wetlands, 17 of which are HP systems. The opportunities for avoidance with these projects are relatively numerous compared to roads because the preponderance of wetlands occur along new alignments. While about 50 percent of the HCT follows existing BNSF right-of-way, portions off the existing ROW occur in the Green River Valley and the Woodinville area, where 42 wetlands could potentially be avoided. Some crossings of riparian wetlands would be unavoidable, but HCT bridges could be used to minimize wetland impacts. The HCT is the most conceptually designed project at this time, and the estimates of wetland impacts associated with the project are therefore commensurate with this uncertainty. Interstate 405 crossings would impact ten wetlands, four of which are HP systems. Pedestrian/bicycle connections would impact four wetlands, two of which are HP systems. In aggregate, this alternative would impact 81 different wetlands, 34 of which are HP systems.

Legend: Alternative One Projects with Wetlands

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

Mill Creek
Lynnwood
Edmonds
Mountlake Terrace
Woodway
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Yarrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Covington
Maple Valley
Auburn
Federal Way

Alternative One Projects with Wetlands

Figure No. 5.2

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Table 5.2: Alternative 1 Impacts

Types of Improvements	Total Wetlands Potentially Impacted	High Priority Wetlands Potentially impacted
Basic Improvements	6	2
Arterial HOV	16	9
Freight & ITS		
HCT	45	17
I-405 Crossings	10	4
Pedestrian/Bicycle	4	2

5.2.1 Construction Impacts

Direct, short-term construction impacts associated with the HCT/TDM Alternative include 13 acres of potential wetland impacts. These impacts are in addition to 12 acres affected by the No Action Alternative. Nine acres of the wetlands to potentially be impacted are associated with the arterial HOV and HCT projects. Approximately 7 acres of fill could be avoided by realigning HOV arterials and/or elevating the HCT. While some part of the HCT system proposed under this alternative may fragment wetlands, much of the new construction presents opportunities to avoid wetlands. The potential for this alternative to fragment wetland habitat is consequently low to moderate. Avoidance opportunities can be examined in detail at the project level.

The amount of construction required for this alternative, while greater than that required for the No Action Alternative, is considerably less than for the other Action Alternatives. It is reasonable to expect that the impacts associated with construction (see Section 5.1.1) would increase proportionally to the amount of construction. Under this assumption, both short- and long-term impacts from noise, sedimentation, and contamination would be less severe than those associated with the other action alternative impacts.

5.2.2 Operational Impacts

Alternative 1 would potentially result in greater operational impacts than the No Action Alternative. The addition of an HCT system would likely have long-term noise impacts, although the degree would depend on the type of system. The HCT elements of this alternative are the only new development proposed. Because new roads are not proposed under the HCT/TDM alternative, the noise impacts from this alternative would be relatively low. The degree of potential noise due to new transit operations would depend heavily upon whether the transit operates on rails or wheels, and on the power source (e.g., diesel vs. electric). Further discussion of noise impacts can be found in the *I-405 Corridor Program Draft Noise Expertise Report* (Parsons Brinkerhoff, 2001).

Three hundred and five acres of increased impervious surface are associated with this alternative. The stormwater associated with this increased impervious surface would require the same treatment and management as the other alternatives relative to the amount of new impervious surface. While the effects of the increased impervious surface

are not quantifiable at the programmatic level, Alternative 1 would result in greater impacts related to impervious surface than the No Action Alternative, but considerably fewer impacts than the other Action alternatives. Further discussion of the potential impacts to water resources may be found in *the I-405 Corridor Program Draft Surface Water Resources Report* and *Groundwater Resources Expertise Report* (CH2M HILL, 2001).

5.2.3 Mitigation Measures

Construction mitigation measures that would reduce wetland impacts are discussed in Section 5.1.5 (No Action General Mitigation). Approximately 13 acres of wetlands would require mitigation under this alternative. This is in addition to the area requiring mitigation under the No Action Alternative. As the area requiring mitigation increases, it would become increasingly difficult to locate suitable sites for in-kind mitigation, and out-of-kind mitigation might be considered. The relative benefits of in-kind and out-of-kind mitigation would be evaluated at the project level. In comparison to Alternatives 2, 3, and 4, Alternative 1 would require approximately 39 acres less mitigation, and is in this respect the most desirable of the action alternatives. The exact ratio of original wetlands to mitigated land would be determined by project-level assessment, but the amount of land requiring mitigation is one fourth that of other action alternatives.

■

5.3 Alternative 2: Mixed Mode with Transit Emphasis

The Mixed Mode with Transit Alternative includes 157 projects, which potentially impact 210 wetlands within the study area, 70 of which are HP wetlands (Figure 5.3, Table 5.3). Total wetland area filled under Alternative 2 would be approximately 52 acres. Under this alternative, basic I-405 improvement projects affect six wetlands, two of which are HP systems. Widening SR 167 would impact approximately 27 wetlands, five of which are HP systems. Connecting freeway capacity projects would impact three wetlands, two of which are HP. Adding an additional general purpose lane in each direction along I-405 would impact 62 wetlands, 10 of which are HP, for a total of 13 acres of wetland fill. Arterial interchange improvements would impact seven wetlands, including three HP wetlands. HOV ramps would impact 16 wetlands, five of which are HP. Arterial HOV projects would impact nine wetlands, including six HP systems. Freight and ITS would impact no additional wetlands. HCT would impact 45 wetlands, including 17 HP systems. Interstate 405 crossings and pedestrian/bicycle connections would collectively impact 14 wetlands, including six HP systems. Planned arterial projects would impact 21 wetlands including 14 HP systems.

Legend: Alternative Two Projects with Wetlands

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

Alternative Two Projects with Wetlands

Figure No. 5.3

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Table 5.3: Alternative 3 Impacts

Types of Improvements	Total Wetlands Potentially Impacted	High Priority Wetlands Potentially impacted
Basic improvements	6	2
Widening of SR 167	27	5
Connecting freeway capacity	3	2
General purpose lane	62	10
Arterial interchange	7	3
HOV ramps	16	5
Arterial HOV	9	6
Freight & ITS	0	0
HCT	45	17
I-405 crossings & ped/bicycle	14	6
Panned arterial	21	14

5.3.1 Construction Impacts

Construction impacts would be similar to those for the other alternatives. Direct, short-term construction impacts associated with the Mixed Mode with Transit Alternative would affect approximately 52 acres of wetland. This is in addition to the 12 acres of impacts under the No Action Alternative. Twelve acres of wetland fill are associated with the addition of one lane in each direction along SR 167. Relative to Alternative 1, a high number of projects are proposed in this alternative. This would potentially result in more impacts, including noise, during the construction period.

Only a few road projects within this alternative have the potential to notably alter wetland buffers. Widening SR 167 from I-405 to the study boundary has the most potential to notably alter wetlands / wetland buffers. New HCT alignments may also alter wetland buffers. Final alignment design could avoid many wetlands and wetland buffers, but impacts associated with riparian wetland crossings (e.g., the Green River or the Sammamish River) would likely be unavoidable.

New road construction associated with this alternative would impact 81 wetlands, bisecting many of them. The potential for this alternative to fragment wetland habitat is consequently high in comparison to the other action alternatives. Impervious surface area doubles with this alternative compared to Alternative 1. A subsequent increase in the effects of runoff, sedimentation, and contamination, and corresponding impacts to wetlands, would be expected. Many of the impacts associated with Alternative 2 are unavoidable, as they are expansions or additions to existing roads and realignment is not practical.

5.3.2 Operational Impacts

Operational impacts of this alternative are similar to those of the other alternatives. New road construction would affect as many as 81 wetlands, while up to 84 wetlands would be impacted by projects located along existing roads. Noise impacts would be more pronounced within the 81 wetlands located along new alignments. The degree of noise associated with HCT would depend largely on the specific system (see Parsons Brinkerhoff, 2001).

Because some new roads and the HCT system are proposed under this alternative, the noise impacts to wetland habitat from this alternative would be moderate to high. Six hundred sixty-five acres of increased impervious surface are associated with this alternative. This amount of impervious surface is more than double the amount expected under Alternative 1, and associated impacts would be high by comparison.

5.3.3 Mitigation Measures

General mitigation is similar to that of the other action alternatives. Alternative 2 would potentially impact 52 acres of wetland in addition to those impacted under the No Action Alternative, and the need for out-of-kind mitigation is consequently greater than for the other alternatives. This alternative would require mitigation for 400 percent more land than Alternative 1 and opportunities to avoid wetlands through realignment are fewer than with Alternative 1. As with all alternatives, the relative merits of out-of-kind mitigation will be assessed at the project level and the appropriate mitigation ratio selected.

■

5.4 Alternative 3: Mixed Mode

The Mixed Mode Alternative includes 144 projects which potentially impact 168 wetlands, including 56 HP wetlands, within the study area (Figure 5.4, Table 5.4). Total wetland area filled under this alternative would be approximately 62 acres. Under this alternative, basic I-405 improvement projects affect two wetlands, one of which is a HP system. Providing two additional general purpose lanes in each direction along I-405 would impact 62 wetlands, including 10 HP systems. Widening SR 167 would impact approximately 27 wetlands, five of which are HP systems. Connecting freeway capacity projects would impact seven wetlands, five of which are HP. Arterial capacity action would impact one HP wetland. Arterial interchange improvements would impact nine wetlands, three of which are HP systems. HOV ramps would impact 16 wetlands, five of which are HP. Arterial HOV projects would impact nine wetlands, including six HP systems. Freight and ITS would impact no additional wetlands. HCT would not impact any additional wetlands, because in this alternative HCT operates on existing or proposed roadways. Interstate 405 crossings and pedestrian/bicycle connections would collectively impact 14 wetlands, including six HP systems. Planned arterial projects would impact 21 wetlands, including 14 HP systems.

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Legend: Alternative Three Projects with Wetlands

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

Alternative Three Projects with Wetlands

Figure No. 5.4

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Table 5.4: Alternative 3 Impacts

Types of Improvements	Total Wetlands Potentially Impacted	High Priority Wetlands Potentially impacted
Basic improvements	2	1
Widening of SR 167	27	5
Connecting freeway capacity	7	5
General purpose lane	62	10
Arterial interchange	9	3
HOV ramps	16	5
Arterial HOV	9	6
Freight & ITS	0	0
HCT	0	0
I-405 crossings & ped/bicycle	14	6
Planned arterial	21	14
Arterial capacity action	1	1

5.4.1 Construction Impacts

Direct, short-term construction impacts associated with the Mixed Mode Alternative include 62 acres of potential wetland impacts. Twenty-seven of these 62 acres are associated with adding two general purpose lanes along I-405 from South Center to Lynnwood. Twelve additional acres of wetland fill are associated with widening SR 167 in both directions by one lane. The number of projects proposed under this alternative is relatively high, and there is the potential for impacts during construction, including noise. This impact is about equal to that expected for Alternative 2.

Only a few road projects within this alternative have the potential to notably alter wetland buffers. Widening SR 167 from I-405 to the study boundary has the most potential to notably alter wetlands / wetland buffers.

Most of the wetland impacts associated with this alternative are associated with expansion / widening of existing roads. New construction would affect 44 wetlands, while 100 wetlands would be impacted by construction along existing roads. The HCT proposed in this alternative would follow existing alignments, and potentially impact no wetlands. The potential for this alternative to fragment wetland habitat is consequently moderate to high, while opportunities to avoid wetlands by realigning proposed roads are few. New impervious surface increases by 600 acres under this alternative. This large area would create an associated increase in sedimentation and contamination from runoff slightly less than-that created by Alternative 2, and high compared to Alternative 1.

5.4.2 Operational Impacts

Because some new roads are proposed under this alternative, the noise impacts to wetland habitat would be moderate. Further discussion of noise impacts may be found in the *I-405 Corridor Program Draft Noise Expertise Report* (Parsons Brinkerhoff, 2001). One hundred out of 144 proposed projects are expansions of existing roads. Therefore, the increases in noise would have less impact for these projects than for new road construction. The amount of impervious surface associated with Alternative 3 is somewhat less than that in Alternative 2.

5.4.3 Mitigation Measures

General mitigation would be similar to that of other alternatives. Approximately 62 acres of wetland fill would require mitigation under this alternative. This is approximately 10 acres more than that requiring mitigation under Alternative 2, and there are fewer opportunities to avoid the wetlands during construction. Acquiring suitable mitigation sites would be a greater challenge than with the alternatives discussed previously. Therefore, out-of-kind mitigation may be necessary and benefits of out-of-kind mitigation might need to be assessed for individual projects.

■

5.5 Alternative 4: General Capacity Emphasis

The General Capacity Alternative includes 104 projects, which potentially impact 233 wetlands, including 62 High Priority wetlands, within the study area (Figure 5.5, Table 5.5). Total wetland area filled under this alternative would be approximately 84 acres. Under this alternative, basic I-405 improvement projects impact six wetlands, two of which are HP systems. Building two express lanes in each direction along I-405 would impact 65 wetlands, 10 of which are HP systems. Widening SR 167 would affect approximately 27 wetlands, five of which are HP systems. Connecting freeway capacity projects would fill four wetlands, two of which are HP. Providing one additional general purpose lane along I-405 would impact 62 wetlands, including 10 HP systems. Arterial capacity action would impact 12 wetlands, including seven HP systems. Arterial interchange improvements would impact nine wetlands, three of which are HP systems. HOV ramps would impact 16 wetlands, five of which are HP. Interstate 405 crossings and pedestrian/bicycle connections would collectively impact ten wetlands, including four HP systems. Planned arterial projects would impact 21 wetlands, including 14 HP systems.

Legend: Alternative Four Projects with Wetlands

- High Priority Wetlands
- Medium & Low Priority Wetlands
- Transit
- HOV
- Freeways
- Arterials
- Non-motorized
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Note: All projects contained in the No Action Alternative (not indicated in Figure) would be implemented as part of each action alternative.

Mill Creek
Lynnwood
Edmonds
Mountlake Terrace
Woodway
Brier
Bothell
Kenmore
Woodinville
Shoreline
Lake Forest Park
Simonds Rd NE
Duvall
KING
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Yarrow Point
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
148th Ave SE
Sammamish
Mercer Island
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
Kent
132nd Ave SE
Des Moines
Maple Valley
Covington
Auburn
Federal Way

Alternative Four Projects with Wetlands

Figure No. 5.5

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Table 5.5: Alternative 4

Types of Improvements	Total Wetlands Potentially Impacted	High Priority Wetlands Potentially impacted
Basic improvements	6	2
Widening of SR 167	27	5
Connecting freeway capacity	4	2
General purpose lane	62	10
Arterial interchange	9	3
HOV ramps	16	5
Arterial HOV		
Freight & ITS		
Two express lanes	65	10
I-405 Crossings & ped/bicycle	10	4
Panned arterial	21	14
Arterial capacity	12	7

5.5.1 Construction Impacts

Direct, short-term construction impacts associated with the General Capacity Alternative are similar to those of the other alternatives and include 84 acres of potential wetland fill in addition to the 12 acres affected by the No Action Alternative. Fifty of these 84 acres of potential wetland impacts are associated with adding two express and one general purpose lane along I-405 from Southcenter to Lynnwood. Twelve additional acres of wetland fill are associated with widening SR 167 in both directions by one lane.

Only a few road projects within this alternative have the potential to notably alter wetland buffers. Widening I-405 to include two express lanes and one general purpose lane in each direction along with widening SR 167 from I-405 to the study boundary have the most potential to notably alter wetlands / wetland buffers.

Road construction along new alignments is equal to that of Alternative 2 and would affect 81 wetlands. An additional 150 wetlands would be affected by construction along existing roads. Thus there is great potential for wetlands fragmentation, coupled with little opportunity to avoid wetlands by altering proposed alignments. Noise impacts are also the highest of any alternative. The greatest area of impervious surface is added in this alternative, and subsequently the greatest impacts due to runoff sedimentation and contamination can be expected.

5.5.2 Operational Impacts

Increased impacts from noise would be greatest under Alternative 4, as it has the most new roads and road expansions. It also would result in the greatest filled acreage and the most new impervious surface. Impervious surface would increase by more than 35 percent over the next highest increase, and corresponding increases in sedimentation and contamination could also be expected. This increase in impervious surface is more

than five times the impervious surface of the No Action Alternative and would result in far greater impacts than this and all other alternatives.

5.5.3 Mitigation Measures

Approximately 84 acres of wetland fill would require mitigation under this alternative. Acquisition of suitable mitigation sites would be most challenging under Alternative 4. Because this alternative potentially impacts 84 acres of wetland beyond those impacted under the No Action Alternative, the potential for out-of-kind mitigation is consequently highest relative to the other alternatives.

5.6 Secondary Effects

Secondary impacts are reasonably foreseeable effects of an action that occur later in time or are further removed in distance from the direct effects of the proposal. Generally, these effects are induced by the initial programmatic action. Programmatic secondary impacts are expected to be limited and unlikely for the I-405 Corridor Program for several reasons:

- All of the I-405 Corridor Program action alternatives are generally compatible with existing regional and local land use plans that have already addressed growth.
- A similar level of projected growth is expected to occur in the region, with or without the action alternatives.
- Transportation projects, similar to I-405, are frequently built in response to population and/or employment growth.
- The I-405 Corridor Program study area is experiencing a high rate of population growth and land development that is increasing travel demand and congestion.

Secondary effects may be more detectable during project-level environmental analysis. Therefore, the potential for secondary effects will be analyzed in the future project-level environmental analysis, documentation, and review.

5.7 Cumulative Effects

Background information related to land use and transportation provides the basis for evaluating cumulative effects for Wetlands and is located in Appendix E of this expertise report.

5.7.1 Regulatory Trends

Wetlands have not been recognized historically for their ecological importance. Many of these areas were filled, dredged, or developed to make the land useful for housing, industry, and agriculture. Between 1780 and 1980, the state of Washington lost an estimated 31 percent of its wetlands. Since that time, wetlands have been identified as providing important economic and environmental functions, such as protection from floodwaters, filtering sediment and pollutants, and providing spawning areas for commercially important fish as well as habitat for many important species of plants and wildlife.

In 1989, Washington adopted state goals for no net loss of acreage or ecological function of wetlands. These goals reflect the Clean Water Act, federal legislation that prohibits the discharge of soil into waters of the United States unless authorized by a permit issued under Section 404 of the Act. The U.S. Army Corps of Engineers (USACOE) has authority over such actions and requires the permittee to restore, create, enhance, or preserve nearby wetlands as compensation for the damage. This means of compensatory mitigation is intended to comply with the general goals of the Clean Water Act and the specific goal of "no net loss" of wetlands. Several regulations have been enacted on a federal and local level to achieve these goals.

The Washington State Growth Management Act was passed in 1990 to address environmental, land use, and sustainable economic development issues related to unplanned growth in specific areas. In 1991, an amendment to the GMA required all counties and cities to adopt regulations for controlling development pressures on wetlands and other critical areas. These critical or sensitive areas ordinances provide restrictions on wetland and stream disturbance and are continually evolving as regulating agencies gain further understanding of the consequences related to these types of disturbance.

Because wetlands provide habitat for several endangered species, the federal Endangered Species Act of 1973 inspired further regulation of impacts to specific types of wetland resources. As the numbers of species listed for protection increase, the extent of protection is evolving and directly connected to growth and subsequent habitat disturbance.

5.7.2 Wetland Resource Trends

Urbanization is the primary cause of wetland loss within the central Puget Sound region and the I-405 corridor. According to a 1998 Washington State Department of Natural Resources publication, more than 90 percent of the wetlands in urban areas in Washington have been lost. Despite the goal of "no net loss," studies show that these goals are not being met. The magnitude of impacts to wetland functions is unknown. Primary wetland functions lost in the study area are due to an increase of impervious surfaces and a decrease in overall wetland area and functional capability. These functions primarily include fish and wildlife habitat, stormwater retention, and sediment and toxics retention.

The lack of available data on wetland loss and replacement as a result of compensatory mitigation makes it difficult to determine the extent of ecological impacts due to wetland

loss. However, as research and expertise develop in the field of wetland ecology, the rate of wetland loss is decreasing while the effectiveness of wetland restoration and replacement activities is increasing.

5.7.3 Ongoing and Proposed Programs for Wetlands Protection and Restoration

Future trends in wetland regulation are likely to focus on compensatory mitigation requirements. Although there has been a great deal of progress in the last 20 years, the goal of no net loss for wetland function has not been accomplished. The degree to which wetland loss is taking place is unknown because not enough data are available to make this determination. Regulatory agencies are expected to develop procedures to track the success and completion of mitigation efforts as this information becomes increasingly more valuable to maintain effective regulatory practices. The focus of mitigation efforts is moving towards emphasizing the replacement of wetland functions, rather than replacement of wetland area. In addition, research and publications show strong indication that mitigation banking is becoming a more favored means of mitigating wetland loss.

Based on preliminary findings from a wetland mitigation banking study released by the Environmental Law Institute, great expansion in mitigation banking has occurred as new states have developed banking programs. The study shows that in 1992, "banks existed in only 17 states, but today, active or pending banks exist in 41 states." As time allows further analysis of the ecological trends in wetlands and associated ecosystems, regulatory agencies will continue to respond to these issues.

Ongoing programs occurring on a local level include proposed revisions to King County's sensitive areas code as well as other codes that regulate sensitive areas such as the clearing and grading code and the shoreline code. Revisions include modifications of definitions, exemptions, and mitigation as well as permit requirements. Snohomish County is also preparing to propose changes to its critical areas code.

5.7.4 Cumulative Effects of I-405 Corridor Program Alternatives

Cumulative effects could occur as a result of the increased pressure for growth and development within the urban centers along the I-405, SR 167, and I-90 corridors and reduced pressure in rural areas outside the study area. Thus, effects on wetlands could be reduced outside the UGA relative to the more urbanized areas within the study area.

In contrast, the No Action Alternative would result in the continuation of pressure for growth in rural areas or at the fringe of the UGA. If allowed to occur by local land use regulatory agencies, that pattern of growth would have the potential to influence some impacts on wetlands from inside the UGA to outside the UGA or from more urbanized areas within the study area to the less developed fringe portions of the UGA.

Under the No Action Alternative, future growth in employment and households, and resulting development, is forecasted to be concentrated in Seattle, southwest Snohomish County, Tukwila, Federal Way, Woodinville, and Bothell. While the more central of these areas are nearer build-out, cumulative effects may pose a threat to high-quality wetlands in the southwest Snohomish County and Woodinville areas where more undeveloped land occurs.

Cumulative effects due to implementation of any of the action alternatives would be similar. Under Alternative 1, pressure for growth increases in the Kent, Renton, and Redmond areas. Wetlands are common in these areas, and cumulative effects could be expected.

Pressure for growth occurring under Alternative 2 would be similar to that under Alternative 1, with greater pressure in the wetlands-rich southwest portion of the study area and the Redmond area, and some added growth pressure on parts of Bellevue. In addition, this alternative shows some pressure for growth in the northern tip of the study area, where high priority wetlands are concentrated. Cumulative effects could be more pronounced in these areas under Alternative 2.

Pressure for growth toward the southwestern, Redmond, and northern portions of the study area would increase under Alternative 3. Cumulative effects could be expected to increase accordingly.

Pressure for growth under Alternative 4 would increase in the northern and south central parts of the study area. Potential cumulative effects on the dense wetlands of these areas would be highest of all action alternatives.

If cumulative effects on high priority wetlands were weighted most heavily, wetland effects would be greatest for Alternative 2 and least for the No Action Alternative and Alternative 1. High priority wetlands near the growth areas of Alternative 1 occur in Kent between SR 167 and I-405 and in Woodinville. High priority wetlands near the growth areas of Alternative 3 occur in Redmond, west of SR 202 and east of the railroad tracks. High priority wetlands near the growth areas of Alternative 4 occur in Redmond and Kent.

The most notable potential cumulative wetland effects associated with construction and development would occur through increases in impervious surfaces, potentially altering runoff volumes and the timing of flood pulses. Project-level design would partially address these issues by designing stormwater control structures to minimize hydrologic effects. Hydrologic effects cannot be completely avoided, as increases in impervious surfaces result in increased stormwater volumes. Alternatives with greater quantities of impervious surface would potentially have a greater effect on wetland hydrology and biologic functions.

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6. COMPARISON OF ALTERNATIVES

Each alternative provides a different mix of projects and transportation elements. Wetland impacts associated with each alternative vary accordingly. Wetlands in the study area are most common in the Kent Valley, in Sammamish Valley of Redmond, in Bellevue at I-405 and I-90, and in the North Creek area of Woodinville and Bothell. In general, impacts to wetlands are least for the No Action Alternative and progressively increase through Alternative 4, ranging from 57 to 233 wetland impacts.

The No Action Alternative creates the least amount of wetland fill (12 acres). Thirteen acres of wetlands would be filled under Alternative 1, in addition to the 12 acres filled under the No Action Alternative. Substantial increases in wetland fill would occur with the other alternatives. Alternatives 2 and 3 would fill 52 and 62 acres of wetlands, respectively, in addition to the wetland acreage filled under the No Action Alternative. Alternative 4 has the greatest potential impacts overall, filling 84 wetlands acres more than the No Action Alternative (Table 6.1).

Analyzing HP wetlands, in addition to total wetlands, is important because HP wetlands would need to be avoided as much as possible, while LP wetlands may provide better opportunities for mitigation. LP wetlands are scattered throughout the study area. In general, HP wetlands in the study area are predominantly located near stream corridors in:

- Redmond (east of SR 202 ; and north west of Lake Sammamish);
- Woodinville (east of I-405, north of SR 522);
- Bellevue (just west of I-405); and
- Kent (large, scattered wetlands east of I-5 to Kent Valley).

Most No Action Alternative improvements near HP wetlands occur in Redmond, Woodinville, and in Renton near I-405. Improvements proposed under the other alternatives impact HP wetlands scattered throughout the study area. The No Action Alternative impacts the lowest number of HP wetlands, followed by Alternatives 1, 3, and 4. Alternative 2 impacts the highest number of HP wetlands, but also offers the greatest opportunity for avoidance. Overall, Alternative 1 appears to have the least impact to wetlands of all alternatives.

Table 6.1: Summary of Wetland Impacts

	No Action	Alt. 1[a]	Alt. 2[a]	Alt. 3[a]	Alt. 4[a]
Wetland Area Impacted (acres)	12	13	52	62	84
Number of Wetlands Impacted	57	81	210	168	233
High Priority Wetlands Impacted	19	34	70	56	62
New Impervious Surface Area (acres)	164	305	640	600	888

[a]All totals are in addition to totals of the No Action Alternative

The No Action Alternative has the lowest increase in impervious surface area, approximately 164 acres. Alternatives 1 through 4 increase the impervious area by 305, 640, and 888 acres, respectively, in addition to the increase under the No Action Alternative.

Overall, Alternative 1 would result in the least amount of pressure on wetlands, while alternatives 3, 2, and 4 would lead to proportionately greater levels of indirect pressures on wetland resources.

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8. GLOSSARY

GIS. Geographic Information System. Digital computer mapping, overlays, and spatial data analysis.

Hydric Soil. Soils that are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Impervious surface area. Surfaces through which water cannot percolate

NWI. National Wetland Inventory, a series of maps developed by the U.S. Fish and Wildlife Service mapping wetlands nationwide.

PHS. Priority Habitats and Species, a series of maps developed by the Washington Department of Fish and Wildlife mapping wildlife resources statewide.

Wetland. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetland buffer. The upland area surrounding wetlands which serves to moderate biological and physical alteration of the wetland.

Wetland category. A ranking of wetlands, typically one through four, by the wetland functions and values. Ranking systems vary by jurisdiction. The highest ranking wetlands are category one, while the lowest are category four.

Wetland function. The physical and biological support roles wetlands provide towards, biological support, stormwater peak flow attenuation, ground water recharge, etc.

Wetland mitigation. Creation, enhancement, or restoration of wetlands to compensate for wetland alterations.

Wetland value. Societal worth placed on wetland attributes and qualities, e.g., the value of flood water storage relative to other means of controlling floods.

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APPENDIX A
Major Elements of Alternatives

Appendix A
I-405 CORRIDOR PROGRAM
MAJOR ELEMENTS OF ALTERNATIVES

1. TRANSPORTATION DEMAND MANAGEMENT

TDM Package Core Assumptions

- Existing TDM programs will continue (public & private sector)
- Existing public TDM programs will be expanded to meet new market demand
- Implementation of trip reduction targets will be supported by new interlocal or sub-regional agreements
- Strategies are flexible, monitored and adjusted as needed over time (includes tracking trends for Internet, e-commerce)
- Funding is provided for demonstration projects, plus some ongoing funding for new TDM strategies found effective

Focus of TDM Package

SOV and other trip reduction through the use of:

- Incentives
- Increasing access to alternative modes
- Public information, education and promotion
- Land use strategies

Strategies in the TDM Package

VANPOOLING

- Maximize vanpooling in the corridor (minimum of a five-fold increase)
  - Intensive marketing of vanpooling, including start-up subsidies
  - Use of new “value-added" incentives (e.g., frequent flyer miles for vanpoolers)
  - Creation of a revolving no-interest loan fund for purchasing vans
  - 50% fare subsidy
  - Provide sufficient infrastructure (e.g., small park & ride lots)
  - Owner-operated vanpool promotion

PUBLIC INFORMATION, EDUCATION & PROMOTION PROGRAMS

- Establish ongoing public education and awareness program specific to the corridor (focus on issues and transportation alternatives)
- Provide traveler information system(s), including interactive ridematch and transit information
- Provide personalized trip planning assistance, including for transit

Strategies in the TDM Package
EMPLOYER-BASED PROGRAMS • Increase work choices Telecommuting, flextime, compressed work schedules, multiple shifts Proximate commuting (assigning employees to work sites close to home) Incentives to employers to offer work choices (e.g., tax credits) • For current commuter trip reduction program – new incentives and resources to help CTR-affected employers obtain CTR goals (e.g., grants, tax credits, staff support) • Expanded CTR-like program aimed at smaller employers plus those larger ones not affected by CTR laws (non-regulatory, voluntary based) • Support development and core operations of transportation management associations (TMA) • Parking cash-out program incentives and financing
LAND USE AS TDM Compact, mixed-use, non-motorized and transit friendly (re)development in target areas (urban centers, suburban clusters, key arterials, transit station areas, transit centers, park-and-ride lots) • Transit-oriented development (TOD) • Code changes, streamlining processes, local connectivity retrofitting projects to support (re)development • Programs (code assistance, design review support) to help jurisdictions and developers implement compact (re)development • New parking management programs
OTHER MISCELLANEOUS TDM PROGRAMS Innovative transit and vanpool fare media, incentives, demonstrations, matching funds, etc. [e.g., area-wide "Smart Card" (FlexPass) programs for Eastgate, downtown Bellevue, north Renton industrial area, Bothell business parks, Redmond, downtown Kirkland, Tukwila] • Non-commute trips TDM programs (research and demonstrations) • Other miscellaneous incentives (local and state tax credit programs, developer incentives)

2. EXPANDED TDM PACKAGE

Overview

This major element will include the range of regional pricing actions being evaluated by the PSRC. The potential impacts of the following actions will be examined in the context of the I-405 Corridor:

- Region-wide congestion pricing (RCP);
- Fuel taxes (revenue = RCP);
- Fuel taxes (revenue = 50% RCP);

- Mileage charge (revenue = RCP);
- Parking charges;
- High occupancy toll lanes.

2. NEW TRANSIT EXPANSION BY 50% WITHIN STUDY AREA

Transit service levels would be increased by 25% compared to the current King County 6-year plan, assumed to be in place by 2007.

Transit service levels would be increased by 50% compared to the current King County 6-year plan, assumed to be in place by 2007.

3. DOUBLE TRANSIT SERVICE WITHIN STUDY AREA

Overview

Transit service levels would be doubled compared to the current King County 6-year plan, assumed to be in place by 2007. The effects of I-695 on short-term transit service have not been assumed. Transit service coverage and design would also be revised to more closely match travel patterns within the study area. These revisions could include more center-to-center movements, connections between neighborhoods and centers, and development of an appropriate 'grid' transit system within the study area.

4. PHYSICALLY SEPARATED HIGH-CAPACITY TRANSIT (HCT)

Description

A high-capacity transit solution would be designed for the I-405 corridor. The exact technology of this solution would be determined in later studies, but could include busway, light rail, monorail, or similar mode that could operate at speeds of up to 70 mph. The HCT alignment would generally follow the I-405, SR 520 and I-90 freeway corridors in existing freeway, arterial, or railroad right-of-way. The key characteristic of this solution would be that it would have a dedicated alignment, removing it from congestion-induced delays. Bus service would be reconfigured to provide maximum accessibility to the HCT system.

Alternatives 1 and 2 assume a full-scale HCT within the corridor, likely using some form of rail technology. Alternative 3 assumes a bus rapid transit (BRT) concept, building on the existing freeway HOV system.

High Capacity Transit		
Jurisdiction	**Project ID***	**Projects**
Tukwila & Renton	T.HCT-1	HCT- SeaTac to Renton CBD
Renton	T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)
Renton, Newcastle & Bellevue	T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria
Bell & Issaquah	T.HCT-4	HCT – Factoria to Issaquah

High Capacity Transit		
Bellevue	T.HCT-5	HCT – Factoria to Downtown Bellevue
Bell & Redmond	T.HCT-6	HCT – Bellevue to Redmond
Bell & Kirkland	T.HCT-7	HCT – Bellevue to Totem Lake
Kirk, King Co. & Woodinville	T.HCT-8	HCT – Totem Lake to Bothell
Bothell & Sno Co.	T.HCT-9	HCT – Bothell to Lynnwood

High Capacity Transit Stations	
Sea-Tac	Sea-Tac
Tukwila	Southcenter
Tukwila & Renton	Tukwila (Longacres)
Renton	Downtown Renton
Renton	North Renton
Renton	Port Quendall
Bellevue	Factoria
Bellevue	Bellevue Transit Center
Bellevue	Bellevue Library
Bell & Kirk	SR 520/Northup Way
Kirkland	Downtown Kirkland (NE 85th Street)
Kirkland	Totem Lake
Woodinville	NE 145th Street
Woodinville	Woodinville
Bothell	NE 195th Street
Bothell	Canyon Park
Snohomish County	164th Street SW (Ash Way)
Bellevue	Eastgate
Bellevue	Lakemont
Issaquah	Issaquah
Bellevue	132nd Avenue NE
Bellevue	148th Avenue NE
Redmond	Overlake (NE 40th Street)
Redmond	Redmond/Town Center
Redmond	Bear Creek
Mercer Island	Mercer Island

6. ADD ARTERIAL HOV AND TRANSIT PRIORITY

Overview

Create lanes, intersection queue jumps and signals that provide priority to HOVs and transit on major arterials in the study area.

Arterial HOV		
Bellevue	R.HOV-36	Coal Creek Pkwy I-405 to Forest Drive
Bellevue	R.HOV-37	NE 8th Street I-405 to 120th Ave NE
Kirkland, Redmond	R.HOV-38	NE 85th St Kirkland Way to 148th Ave NE
Kirkland	R.HOV-39	NE 116th 98th Ave NE to 124th Ave NE
Kirkland	R.HOV-40	NE 124th 100th Ave NE to 132 Ave NE
Bothell	R.HOV-41	SR 527 From SE 228th St to SR 524
Renton	R.HOV-43	SR 169 - SR 405 to Riverview Park vicinity - HOV/Transit Preferential treatment.
Renton	R.HOV-44	SW 27th St Corridor in Renton - Oaksdale Ave to SR 167
Redmond	R.HOV-47	Avondale Rd from Novelty Hill Road to Avondale Way Construct SB HOV lane
Renton, King Co	R.HOV-48	SW 43 St (SR 167 to 140 Ave SE)
Renton	R.HOV-49	Logan Ave N / N 6 St (S 3 St to Park Dr)
Renton	R.HOV-51	Park Dr - Sunset Blvd (Garden Ave to Duvall Ave NE)
Kenmore	R.HOV-53	68 Ave NE (Smds Rd to SR 522) - Construct NB HOV lane
Redmond	R.HOV-55	Willows Rd (Redmond Wy to NE 124 St)
Kirkland, Bell	R.HOV-56	Lake Wa Blvd (SR 520 to Yarrow Bay) - SB HOV lane
Kirkland	R.HOV-57	NE 68 St/NE 72 Pl (I-4405 Vicinity) – Que Bypass
Bellevue	R.HOV-60	Bellevue Way - I-90 to South Bellevue Park and Ride

7. HOV EXPRESS ON I-405 WITH DIRECT ACCESS RAMPS

Overview

Complete the series of ramps connecting arterials and freeways directly to HOV lanes on I-405. This allows carpools, vanpools and buses to use the HOV lanes without weaving across other traffic. HOV direct access ramps have already been designed by Sound Transit in downtown Bellevue and Kirkland, and design studies are starting for HOV ramps in downtown Renton.

HOV Interchange Ramps (Direct Access)		
Tukwila	R.HOV-25	SR 5 I/C @ Tukwila Fwy to Fwy HOV ramps,
Renton	R.HOV-26	SR 167 I/C Fwy to Fwy HOV ramps,
Bellevue	R.HOV-27	SR 90 I/C Fwy to Fwy HOV ramps,
Bellevue	R.HOV-28	SR 520 Fwy to Fwy HOV ramps,
Bothell	R.HOV-29	SR 522 Fwy to Fwy HOV Ramps
Sno. Co.	R.HOV-30	SR 5 I/C @ Swamp Creek Fwy HOV ramps.
Kirkland	R.HOV-61	NE 85th
ST	R.HOV-101	I-405 @ Lind – HOV Direct Access
Newcastle	R:HOV-65	112th St SE (In-Line Station)

Committed HOV Projects		
Bellevue	HOV-01	I-405 at NE 4th/6th/8th (Bellevue)/Construct new HOV direct access at NE 6th, Improve arterial capacity at NE 4th/8th interchanges
Bellevue	HOV-02	I-90 (Eastgate)/New I-90 HOV direct access connection to P&R
Renton	R.HOV-32	Between Sunset and SR-900 /Park Ave interchange in Renton
ST	R:HOV-66	I-405 at 128th St/HOV direct access improvements
Renton	R.HOV-33	NE 44th I/C - HOV Direct Access and Arterial Improvements(Assumes Port Quendall)
WSDOT	HOV-14	I-405 (I-5 Swamp Creek to SR 527)/Construct NB and SB HOV lanes total 6 lanes
Bothell	R.HOV-62	SR 522 Campus Access
Bothell	R.HOV-63	SR 527 Flyer Stop
ST	HOV-102	Woodinville Arterial Enhancements/HOV arterial enhancements

8. ADD PARK-AND-RIDE CAPACITY TO MEET DEMAND

Overview

Provides additional park-and-ride capacity at existing locations and creates selected new lots based on forecasted transit and carpool demand. The locations initially identified for expansion are listed below. These locations will be refined during the evaluation process.

Park and Rides		
Renton	T.PR-3	Renton East Highlands new Park and Ride
Tukwila & Renton	T.PR-6	Tukwila Commuter Rail (Longacres)
King County	T.PR-5	140th Ave SE and Petrovitsky Rd Vicinity
King County	T.PR-8	SR 169 and 140th WY SE
King County	T.PR-9	Petrovitsky Rd and 157th Ave SE
King County	T.PR-10	140th Ave SE and SE 192nd
King County	T.PR-11	SR 515 and SE 208th
Kent & Renton	T.PR-12	SR 167 and SW 43rd
Kent & Renton	T.PR-13	SR 167 and 84th Ave
Redmond	T.PR-17	Willows Rd @ NE 100th
Redmond	T.PR-18	SR 202 @ NE 100th
Bellevue & Kirkland	T.PR-20	South Kirkland
Redmond	T.PR-21	Overlake
Bellevue	T.PR-22	South Bellevue
Bellevue	T.PR-23	Newport (112th Ave. SE)
King County	T.PR-24	NE 160th/Brickyard Rd
Bothell	T.PR-25	Canyon Park (I-405 and SR 527)
Tukwila	T.PR-30	Tukwila
Kirkland	T.PR-31	Houghton
Kirkland	T.PR-32	Kingsgate
Medina	T.PR-33	Evergreen Point
Bellevue	T.PR-34	Wilburton
King County	T.PR-35	Lakemont
Redmond	T.PR-36	Redmond
Redmond	T.PR-37	Bear Creek
Bothell	T.PR-38	Bothell
Kenmore	T.PR-39	Northshore
Kenmore	T.PR-40	Kenmore
Woodinville	T.PR-41	Woodinville
Mercer Island	T.PR-42	Mercer Island
Bellevue	T.PR-43	Eastgate

9. ADD TRANSIT CENTER CAPACITY TO MEET DEMAND

Overview

Expand existing transit centers and create new transit centers to accommodate increased transit service. The specific locations for expansion and new centers will be identified during the evaluation process. Alternatives 1, 2, and 3 will require transit center capacity to accommodate a significant increase in transit service, at designated HCT stations, and at feeder bus connections. A partial listing is below.

Transit Center Capacity		
Renton	T.TC-6	Downtown Renton
Bellevue	T.TC-8	Downtown Bellevue
Redmond	T.TC-9	Overlake
Redmond	T.TC-10	Redmond/Town Center
Kirkland	T.TC-12	Downtown Kirkland
Kirkland	T.TC-14	Totem Lake

10. BASIC I-405 IMPROVEMENTS

Overview

This major element fixes existing bottlenecks and locations with safety deficiencies along I-405.

Basic I-405 Improvement Projects		
Jurisdiction	**Project ID***	**Projects**
Renton	R.BI.1	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167
Kirkland	R.BI.2	Continue NB climbing Lane from NE 70th to NE 85th and continue as auxiliary Lane to NE 116th
Kirkland	R.BI.3	SB auxiliary Lane NE 124th to NE 85th
Bellevue	R.BI.4	I-90 / Coal Creek Interchange
Bothell, King Co, Kirkland	R.BI.5	SB SR 522 to 124th continue climbing lane as an auxiliary lane
Bothell	R.BI.6	NB auxiliary lane SR 522 to SR 527
Renton	R.BI.7	Kennydale Hill climbing lane - SR 900 to 44th - NB 900 to 30th, SB 44th - 30th
Bellevue	R.BI.8	I-90 to Bellevue SB HOV direct connection to I-90 west
Bellevue	R.BI.9	NB auxiliary lane I-90 to NE 8th
Bellevue	R.BI.10	Increase SR 405 to Eastbound SR 520 Ramp capacity
Renton	R.BI.14	NB Auxiliary Lane I-5 to SR 167
Various	R.FR-24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)
WSDOT	R-55	I-405/SR 167 Interchange/Construct new southbound I-405-to-southbound SR 167 ramp modification.

11. ADD 2 GENERAL PURPOSE LANES EACH DIRECTION ON I-405

Add up to 2 general purpose lanes to I-405 through widening of the existing freeway. A design option is to create collector-distributor lanes in selected corridor segments (See Element 12).

12. PROVIDE COLLECTOR DISTRIBUTOR LANES ON I-405

Overview

Collector- Distributor lanes provide more time for traffic to safely enter or exit from roadway by providing lanes removed from general travel. This is being considered as a design option to handle the addition of one or two general purpose lanes in each direction along I-405 in certain sections. Collector-Distributor lanes have been included as parts of other elements.

13. ADD TWO EXPRESS LANES EACH DIRECTION ON I-405

Overview

This element consists of a four-lane express facility designed to operate with limited interchanges along the length of I-405. The express lanes would be physically separated from the rest of I-405 through the use of barriers. Certain segments could operate within the median of I-405, while other segments would need to be elevated, in tunnel, or on separate alignments.

The express lanes could operate as a general purpose facility or as a managed facility, such as a 'High Occupancy Toll (i.e. HOT) lane. Certain users could be allowed to use the express lanes for free, while other users could be allowed to 'buy-in' to available capacity. The capacity would be priced depending upon demand.

Express Lanes – 2 Lanes each Direction between Major Interchanges		
Jurisdiction	**Project ID**	**Projects**
Tukwila, Renton	R.TC-20	Add Express lanes - SR 5 Tukwila to SR 167
Renton	R.TC-21	Add Express lanes - SR 167 to SR 900 north Renton I/C
Renton, Newcastle, Bellevue	R.TC-22	Add Express lanes -SR 900 North Renton I/C to SR 90
Bellevue	R.TC-23	Add Express lanes - SR 90 to SR 520
Bellevue, Kirkland	R.TC-24	Add Express lanes - SR 520 to NE 70th
Kirkland	R.TC-25	Add Express lanes - NE 70th to NE 124th
Kirkland, King County, Bothell	R.TC-26	Add Express lanes - NE 124th to SR 522
Bothell	R.TC-27	Add Express lanes - SR 522 to SR 527
Bothell and Snohomish Co.	R.TC-29	SR 527 to vicinity of Damson Road
Renton	R.TC-28	Add Express lanes- on SR 167 north of 180th up to I-405

Express Lanes –Access Locations		
Snohomish Co	R.TC-30	Northern end to Express lanes - Between SR 527 and I-5
King Co/Kirkland	R.TC-31	Slip Ramp- South of NE 160th St
Kirkland	R.TC-32	Slip Ramp- South of NE 70th St
Bellevue, Newcastle	R.TC-33	Slip Ramp- South of Coal Creek Pkwy
Renton	R.TC-34	Interchange access location- SR 167

14. WIDEN SR 167 BY 1 LANE EACH DIRECTION TO KENT (STUDY AREA BOUNDARY)

Overview

SR 167 would be widened by one lane in each direction to accommodate additional demands due to growing demands and the effects of improvements at the I-405/SR 167 interchange. The widening is assumed to extend at least to the study area boundary in Kent. Alternative 3 will consider the potential to add a total of two lanes in each direction to SR 167 within 1 mile of I-405, due to the substantial capacity additions assumed for I-405. This element does not presume that SR 167 would be redesignated as I-405, although each of these improvements would be compatible with such a redesignation if it occurs.

16. IMPROVE CONNECTING FREEWAY CAPACITY TO I-405

Overview

Enhance the capacity of connecting freeways by one lane in each direction (for a distance of approximately ½ to 1 mile on both sides of I-405) to avoid bottlenecks at the connections to I-405.

Connecting Freeway Capacity (One Lane, Each Direction)		
Jurisdiction	**Project ID**	**Projects**
Tukwila	R.CF.1	SR 518 I-405 to SR 99/Airport Access
Bellevue	R.CF.3	I-90 South Bellevue to Eastgate
Bellevue	R.CF.4	SR 520 Bellevue Way to 148th Avenue NE
Bothell, Woodinville	R.CF.5	SR 522 Bothell to NE 195th
Snohomish Co, Lynnwood	R.CF.6	SR 525 I-405 to SR 99
Renton, Kent	R.CF.8	SR 167 I-405 to Study Area Boundary
Tukwila	R.CF.9	I-5 at Tukwila
Lynnwood	R.CF.10	I-5 at Swamp Creek – 196th to 164th

17. IMPLEMENT PLANNED ARTERIAL IMPROVEMENTS

Overview

This major element involves the implementation of several arterial improvements called for in local agency plans and the Eastside Transportation Program (ETP). The ETP has been an ongoing process by regional, county and local governments to coordinate transportation planning and funding in East King County. Many of the ETP projects have already been examined in detail by the agencies involved and have been determined to be effective in addressing a variety of transportation issues.

Eastside Transportation Projects - Committed Projects		
Jurisdiction	**Project ID**	**Projects**
Bellevue	R-08	NE 29th Pl (148th Ave NE to NE 24th St)/Construct new 2-lane road
Bellevue	R-101	150th Ave SE---Widen to 7 lanes from SE 36th to SE 38th; add turn lanes
KCDOT	R-40	Juanita-Woodinville Way (NE 145 St to 112th Ave NE) Widen to 5 lanes + CGS, walkway/pathway
KCDOT	R-47	NE 124 St (Willows Rd to SR 202)--- Widen to 4/5 lanes + CGS, bike facilities; traffic signal.
Kirkland	R-21	NE 120 St (Slater Ave to 124 Ave NE)--- Construct new 3-lane roadway with ped/bike facilities
Redmond	R-111	Willows Rd Corridor Improvements-- Channelization of Willows Rd/Redmond Way intersection and widening of Willows Rd from NE 116th to NE 124th
Redmond	R-26	NE 90 St (Willows Rd to SR 202)--- Construct new 4/5 lanes + bike facilities
Redmond	R-28	West Lake Sammamish Parkway (Leary Way to Bel-Red Rd)--- Widen to 4/5 lanes + CGS, bike lanes
Renton	R-36	Oakesdale Ave SW (SW 31st to SW 16th)--- Construct new 5 lane roadway with CGS
Snohomish Co.	R-10	SR 524 (24 St SW to SR 527)--- Widen to 4/5 lanes including sidewalks, bike lanes
Snohomish Co.	R-117	39th Ave SE Realignment at SR 524 and York Rd--- Construct 4-way intersection to replace 2 offset intersections
Bothell, Snohomish Co.	R.AC-21	120th NE/39th SE - NE 95th to Maltby Rd - 4/5 lanes including new connection
Woodinville	R-51	Woodinville-Snohomish Rd/140 Ave NE (NE 175 St to SR 522)--- Widen to 4/5 lanes + CGS, bike lanes
Woodinville/ WSDOT	R-25	SR 202 Corridor Improvements(East Lake Sammamish Pkwy to Sahalee Way)--- Widen to 3/5 lanes; intersection improvements with bike/ped facilities
KCDOT	R-39	140 Ave SE (SR 169 to SE 208 St)--- Widen to 5 lanes SR 169 to SE 196 St, widen for turn channels on SE 196. Combines 2 King County CIP projects. A major North-South arterial which serves the Soos Creek Plateau and Fairwood.

Eastside Transportation Projects - Planned Projects		
Jurisdiction	**ETP #**	**Projects**
Bellevue	R.PA-2	148 Ave SE (SE 24 St to SE 28 St) New SB lane from SE 24 St to the WB I-90 on-ramp (ETP 203)
Bothell	R.PA-3	SR 522 Multimodal Corridor Project--- Widen SR-522 mostly within existing ROW to provide transit lanes, safety improvements, consolidated driveways & left turn lanes; and sidewalks. (ETP R-107)
Bothell	R.PA-4	SR 524 (SR 527 to Bothell City Limit)--- Widen to 5 lanes + CGS, bike facilities (class III) (ETP R-11)
KCDOT	R.PA-5	SE 212 Way/SE 208 St (SR 167 to Benson Rd/SR 515)--- Widen to 6 lanes + bike facilities, Transit/HOV preferential treatment, turn channels. (ETP R-46)
KCDOT	R.PA-8	NE 124/128 St (SR 202 to Avondale Rd)--- Widen to 4/5 lanes including bike & equestrian facilities (ETP 164)
KCDOT	R.PA-10	NE 132 St Extension (132 Ave NE to Willows Rd Ext.)---- Construct new 3 lane arterial with CGS, bike lanes (ETP 61)
Kenmore/KCDOT	R.PA-11	68 Ave NE (Simonds Rd to SR 522)--- Construct NB HOV lane total of 5/6 lanes (ETP 22)
Kirkland	R.PA-12	124 Ave NE (NE 85 St to Slater Rd NE)---- Widen to 3 lanes (s. of NE 116th St, 5 lanes n. of NE 116th St with ped/bike facilities (ETP R-23)
Kirkland	R.PA-13	NE 132 St (100 Ave NE to 116 Way NE)--- Widen to 3 lanes + CGS, Bike lane (ETP R-124)
Kirkland	R.PA-14	NE 100 St (117 Ave NE to Slater Ave) --- Construct bike/pedestrian/emergency Vehicle overpass across I-405 (ETP 309)
Newcastle	R.PA-15	Coal Creek Pkwy (SE 72 St to Renton City Limits)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signals (ETP R-24)
Redmond	R.PA-16	Redmond 148th Ave NE Corridor - 3 projects--- Turn lane and channelization improvements along corridor – BROTS; (ETP R-112)
Redmond	R.PA-17	Bear Creek Pkwy--- Construct new 162nd Ave NE arterial and new 72nd St arterial w/ bike/ped and CSG; widen Bear Creek Pkwy (ETP R-110)
Redmond	R.PA-18	Union Hill Rd (Avondale Rd to 196 Ave NE)--- Widen to 4/5 lanes with bike facilities (ETP R-27)
Renton	R.PA-19	Duvall Ave NE (NE 4 St to NE 25 Court -City Limits)--- Widen to 5 lanes + CGS, bikeway (ETP R-31)
Renton	R.PA-20	Oakesdale Ave SW (Monster Rd to SR 900) Replace Monster Rd Bridge; widen to 4/5 lanes +Bike Lanes + CGS (ETP R-35)
Renton	R.PA-21	Rainier Ave / Grady Way (intersection)-- Grade separation (ETP R-33)

Eastside Transportation Projects - Planned Projects		
Renton	R.PA-22	SW Grady Way (SR 167 to SR 515)-- Rechannelize and modify signals for a continuous eastbound lane (ETP R-37)
Renton	R.PA-23	SR 167 at East Valley Road--- New southbound off-ramp and signalization at East Valley Road (ETP 255)
Renton/ KCDOT	R.PA-24	Soos Creek Regional Links --- Placeholder for Trans-Valley Study (ETP R-115)
Woodinville	R.PA-25	SR 522 Interchange Package(SR 522/SR 202 &SR522/195th St))-- Access improvements and new freeway ramps (ETP R-53) (See R.AC-30)
Woodinville	R.PA-26	SR202 Corridor Package (SR202/148th Ave & SR202/127th Place)--- Intersection improvements (ETP R-54)
WSDOT	R.PA-27	SR 520/SR 202 Interchange-- Complete interchange by constructing a new ramp and thru lane on 202 to SR 520 (ETP R-29)
WSDOT	R.PA-28	SR 202 / 140 Place NE (NE 124 St to NE 175 St)--- Widen 4/5 lanes (ETP R-43) (See R.AC-17, 18)

18. EXPAND CAPACITY ON NORTH-SOUTH ARTERIALS

Overview

This element expands arterial capacity to provide connected north-south travel. This element would facilitate vehicular movement without requiring as many trips along I-405.

North-South Arterial Projects		
King Co	R.AC-2	138th Ave - Petrovitsky Rd to SR 169- Add 1 lane
King Co, Renton	R.AC-3	138th Ave SE - Construct roadway link to 4/5 lanes- SR 169 to NE 4th St
Redmond	R.AC-15	Willows Rd- NE 90th St to NE 124th St- Add 1 lane each direction
King Co, Woodinville	R.AC-16	Willows Rd- NE 124th St to NE 145th St- construct new facility -4/5 lanes
Woodinville	R.AC-17	SR 202- NE 145th St to SR 522- widen to 5 lanes
Redmond, King County, Woodinville	R.AC-18	SR 202 - NE 90th to NE 145th
Bothell, Snohomish County, Mill Creek	R.AC-20	SR 527/Bothell Everett Hwy - SR 522 to SR 524 - Widen by 1 lane each direction
Bothell, Woodinville	R.AC-30	SR 202 connection across SR 522 to 120th
Tukwila	R.AC-35	SR 181- S 180th to S 200th
Tukwila	R.AC-36	SR 181- 144th to Strander Blvd.
Tukwila	R.AC-37	Southcenter Blvd - Tukwila Pky to Strander Blvd

19. UPGRADE ARTERIAL CONNECTIONS TO I-405

Overview

This element provides for upgrading arterial connections to I-405. These projects are intended to improve operations at on- and off-ramps as well as on the arterials themselves. An additional lane in each direction was assumed for these arterials, although further analysis may show that similar benefits could be achieved through selected intersection improvements in some cases.

Arterial Interchange Improvements (One Lane Each Direction)		
Jurisdiction	**Project ID**	**Projects**
Tukwila	R.IC-3	SR 181 West Valley Highway/ Interurban
Renton	R.IC-4	SR 169 Maple Valley Hwy SR 900 to NE 5th
Bellevue	R.IC-6	Coal Creek Pkwy I-405 to Factoria Blvd.
Kirkland, Redmond	R.IC-8	NE 85th St-Kirkland Way to 124th
Kirkland	R.IC-9	NE 116th- 114th Ave NE to 124th Ave NE
Kirkland	R.IC-10	NE 124th- 113th Ave NE to 124th Ave NE
Kirkland	R.IC-26	NE 132nd - 113th to 124th Ave NE
Bothell	R.IC-11	SR 527-228th to SR 524
Kirkland, King Co	R.IC-14	New half diamond interchange to/from north at NE 132nd St
Bothell	R.IC-21	New SR 405 Interchange at 240th Street SE(Bothell)
Bothell	R.IC-24	NE 160th Street-112th Ave to Juanita/Woodinville Way

21. CORRIDOR PEDESTRIAN AND BICYCLE IMPROVEMENTS

Overview

Non-motorized improvements throughout the corridor provide needed connections between modes (e.g. pedestrian overpasses from park and rides to freeway bus stops) and allow for commutes or trips to be made by walking or biking. Alternative 3 will exclude all of the 'long-distance' trails (identified below under the heading Pedestrian/Bicycle Connections) from this element. These improvements need further refinement in the context of other major elements in the alternatives.

Pedestrian/Bicycle (I-405 Crossings)		
Bellevue	NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks
Bothell	NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility
King County	NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder
King County	NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder
Renton	NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder
Renton	NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder
Bothell	NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike over-crossing of I-405
Bothell	NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility

Pedestrian/Bicycle Connections		
Bellevue	NM.P&B-4	Lake Washington Blvd - SR 405 to SE 60th - Add ped/bike facilities
Bellevue, Kirkland	NM.P&B-2	BNSF Right of Way - SE 8th to Totem Lake - Add ped/bike facility.
Bellevue, Newcastle, Renton	NM.P&B-6	Lake Washington Blvd/112th - SE 60th to May Creek I/C - Add ped/bike facility
Bothell	NM.P&B-5	North Creek Trail Link - 240th to 232nd - Add ped/bike trail.
Renton	NM. P&B 14	Cedar River Trail S. Extension - I-405 to Burnett Ave - Add ped/bike facilities (ETP NM-17)
Renton	NM. P&B 15	Cedar River Trail/Lake Washington Blvd Connector - Cedar River Trail to Lk Wash Blvd Loop - Add ped/bike facilities (ETP NM-15)
Renton	NM. P&B 16	Cedar-Duwamish Trail Connection - I-405 to Interurban Ave. S. - Add ped/bike facilities
Renton	NM. P&B 17	I-405/SR-167 trail connection - Lind Ave. SE to Talbot Rd S. - Add trail connection
Renton/Tukwila	NM. P&B 18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities
Tukwila	NM. P&B 19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes

22. I-405 CORRIDOR INTELLIGENT TRANSPORTATION SYSTEM ENHANCEMENTS

Overview

This major element provides ITS enhancements to facilitate more reliable traffic flow.

I-405 Corridor ITS Enhancements		
Jurisdiction	**Project ID**	**Projects**
Various	ITS.1	Add Camera Coverage to decrease TMC blind spots
Various	ITS.2	Complete Ramp Metering
Various	ITS.4	Dual Lane Ramp Metering
Various	ITS.5	Increased Incident Response
Various	ITS.6	Traffic adaptive control on arterials
Various	ITS.7	TIS before all major decision points
Various	ITS.8	WSDOT support of in-vehicle traffic information
Various	ITS.9	Arterial camera coverage

23. I-405 CORRIDOR FREIGHT ENHANCEMENTS

Overview

This major element focuses on improvements specific to freight movements. Note that freight will benefit as well from general purpose traffic expansion described in other elements.

I-405 Corridor Freight Enhancements		
Jurisdiction	**Project ID**	**Projects**
Renton	R.FR-10	Modify SR 167 Interchange for East to South Freight movements
Various	R.FR-11	Improve truck flow with ITS
Various	R.FR-23	Remote area for overnight freight parking and staging for early morning deliveries
Various	R.FR-26	Full depth shoulders for truck usage on key freeways and arterials)
Various	R.FR-27	Traveler Information System (TIS) on SR 167 for I-405 “options”
Various	R.FR-28	TIS on I-5 for SR 18/I-90; and 164th to I-405; and South 200th to I-405
Various	R.FR-29	Centralized fax/radio for real time congestion reporting for dispatchers and truck drivers. Leverage WSDOT video linkages (e.g., a “T-911” number).
Various	R.FR-30	Hours of operation and service periods optimized—“JIT” redefined for applicable service sectors (e.g. restaurants)
Various	R.FR-32	Light cargo delivery using Sound Transit service

APPENDIX B
Alternatives Project Matrix

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
		Jurisdiction	*ACTIONS*		5	1	2	3	4
Element #					No Action	HCT/TDM	Mixed Mode with HCT/Transit Emphasis	Mixed Mode	General Capacity
10.	**Basic I-405 Improvement Projects**								
	Renton	R.BI-1 & R.FR-10	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167			✓	✓	✓	✓
	Kirkland	R.BI-2	Continue NB climbing Lane from NE 70th to NE 85th and continue as auxiliary Lane to NE 116th			✓	✓		✓
	Kirkland	R.BI-3	SB auxiliary Lane NE 124th to NE 85th			✓	✓		✓
	Bellevue	R.BI-4	I-90 / Coal Creek Interchange			✓	✓	✓	✓
	Both,King Co,Kirk	R.BI-5	SB SR 522 to 124th continue climbing lane as an auxiliary lane			✓	✓		✓
	Bothell	R.BI-6	NB auxiliary lane SR 522 to SR 527			✓	✓		✓
	Renton	R.BI-7	Kennydale Hill climbing lane - SR 900 to 44th - NB 900 to 30th, SB 44th - 30th			✓	✓		✓
	Bellevue	R.BI-8	I-90 to Bellevue SB HOV direct connection to I-90 west			✓	✓		✓
	Bellevue	R.BI-9	NB auxiliary lane I-90 to NE 8th			✓	✓		✓
	Bellevue	R.BI-10	Increase SR 405 to Eastbound SR 520 Ramp capacity			✓	✓		✓
	Renton	R.BI-14	NB Auxilliary Lane I-5 to SR 167			✓	✓		✓
	Various	R.FR.24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)			✓	✓	✓	✓
10.	**Committed Freeway Projects**								
	Joint	R-17 & R-17(17)	I-90/SR 900 Interchange and SR 900 improvements/Interchange reconfiguration Outside of Study Area						
	Joint	R-19	I-90/Sunset Way Interchange/Complete interchange and upgrade nonmotorized connections. Outside of Study Area						
	WSDOT	R-55	I-405/SR 167 Interchange/Construct new southbound I-405-to-southbound SR 167 ramp modification.		✓	✓	✓	✓	✓
	SR 405 Through Capacity (TC)								
11.	**Two additional GP lanes in each direction**								
	Tukwila,Renton	R.TC-1	Two additional GP lanes in each direction - SR 5 Tukwila to SR 167					✓	
	Renton	R.TC-2	Two additional GP lanes in each direction - SR 167 to SR 900/North Renton I/C					✓	
	Renton, Nwcas,Bel	R.TC-3	Two additional GP lanes in each direction - SR 900/North Renton I/C to SR 90					✓	
	Bellevue	R.TC-4	Two additional GP lanes in each direction - SR 90 To SR 520					✓	
	Bellevue,Kirkland	R.TC-5	Two additional GP lanes in each direction - SR 520 to NE 70th					✓	
	Kirkland	R.TC-6	Two additional GP lanes in each direction - NE 70th to NE 124th					✓	
	Kirk,K C,Both	R.TC-7	Two additional GP lanes in each direction - NE 124th SR 522					✓	
	Bothell,Sno Co	R.TC-8	Two additional GP lanes in each direction - SR 522 to SR 527					✓	
	Sno Co	R.TC-9	Two additional GP lanes in each direction - SR 527 to SR 5 Swamp Creek					✓	
13.	**Express Lanes- 2 lanes each direction between major interchanges**								
	Tukwila,Renton	R.TC-20 + R.TC-29a	Add Express lanes - SR 5 Tukwila to SR 167						✓
	Renton	R.TC-21	Add Express lanes - SR 167 to SR 900 North Renton						✓
	Ren, Nwcas,Bel	R.TC-22 + R.TC-33	Add Express lanes -SR 900 North Renton I/C to SR 90						✓
	Bellevue	R.TC-23	Add Express lanes - SR 90 to SR 520						✓
	Bellevue,Kirkland	R.TC-24 + R.TC-32	Add Express lanes - SR 520 to NE 70th						✓
	Kirkland	R.TC-25	Add Express lanes - NE 70th to NE 124th						✓
	Kirk,K C,Both	R.TC-26 + R.TC-31	Add Express lanes - NE 124th to SR 522						✓
	Bothell,Sno Co	R.TC-27	Add Express lanes - SR 522 to SR 527						✓
	Sno. Co	R.TC-29 + R.TC-30	Add Express Lanes - SR 527 to SR 5 Swamp Creek						✓
	Renton	R.TC-28	Add Express lanes- on SR 167 north of 180th up to I-405						✓

∗ Evaluated within another project

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
		Jurisdiction	*ACTIONS*		5	1	2	3	4
Element #					**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
13.	**Express Lanes - Access Locations**								
	Tuk & Renton		R.TC-29a & R.TC-20	Southern end to Express lanes - Between SR 181 and SR 167					✓ ✻
	Snohomish Co		R.TC-30 & R.TC-29	Northern end to Express lanes - Between SR 527 and I-5					✓ ✻
	King Co,Kirkland		R.TC-31 & R.TC-26	Slip Ramp- South of NE 160th St					✓ ✻
	Kirkland		R.TC-32 & R-TC-24	Slip Ramp- South of NE 70th St					✓ ✻
	Bellevue, Newcastle		R.TC-33 & R.TC-22	Slip Ramp- South of Coal Creek Pkwy					✓ ✻
	Renton		R.TC-34	Interchange access location- SR 167					✓
14.	**Widen SR 167 by 1 lane each direction to study Area boundary**								
	Renton, Kent		R.CF-8	SR 167 I-405 to Study Area Boundary			✓	✓	✓
14A.	**SR 167 / I-405 Interchange Improvements**								
	Renton		R.FR-10 & R.BI-1	SR 167/I-405 Interchange Add Directional Ramps for major movements			✓ ✻	✓ ✻	✓ ✻
16.	**Connecting Freeway Capacity (Matched to fit I-405 Improvements)**								
	Tuikwila		R.CF-1	SR 518 I-405 to SR 99/Airport Access			✓	✓	✓
	Bellevue		R.CF-3	I-90 South Bellevue to Eastgate				✓	✓
	Bellevue		R.CF-4	SR 520 Bellevue Way to 148th					✓
	Bothell, Woodin		R.CF-5	SR 522 Bothell to NE 195th			✓	✓	✓
	Sno Co, Lynnwood		R.CF-6	SR 525 I-405 to SR 99			✓	✓	✓
	Tukwila		R.CF-9	I-5 at Tukwila			✓	✓	✓
	Lynnwood		R.CF-10	I-5 at Swamp Creek - 44th to 155th			✓	✓	✓
10A.	**One additional GP or Auxiliary lane in each direction**								
	Tukwila,Renton		R.TC-9	One additional GP lanes in each direction - SR 5 Tukwila to SR 167			✓		✓
	Renton		R.TC-10	One additional GP lanes in each direction - SR 167 to SR 900/North Renton I/C			✓		✓
	Ren, Nwcas,Bel		R.TC-11	One additional GP lanes in each direction - SR 900/North Renton I/C to SR 90			✓		✓
	Bellevue		R.TC-12	One additional GP lanes in each direction - SR 90 To SR 520			✓		✓
	Bellevue,Kirkland		R.TC-13	One additional GP lanes in each direction - SR 520 to NE 70th (Varify need for additional through capacity on this section)			✓		✓
	Kirkland		R.TC-14	One additional GP lanes in each direction - NE 70th to NE 124th			✓		✓
	Kirk,K C,Both		R.TC-15	One additional GP lanes in each direction - NE 124th SR 522			✓		✓
	Bothell,Sno Co		R.TC-16	One additional GP lanes in each direction - SR 522 to SR 527			✓		✓
	Sno. Co		R.TC-17	One additional GP lanes in each direction - SR 527 to SR 5 Swamp Creek			✓		✓
18.	**Arterial Capacity (AC) Actions**								
	King Co		R.AC-2 & R-39	138th Ave - Petrovitsky Rd to SR 169- Add 1 lane. See R-39					
	King Co, Renton		R.AC-3	138th Ave SE - Construct roadway link to 4/5 lanes- SR 169 to NE 4th St				✓	✓
	Ren, Nwcas,Bel		R.AC-4	140th Ave/Coal Creek Pkwy- Widen to 6 lanes to I-405					
	Redmond		R.AC-15 & R-111	Willows Rd- NE 90th St to NE 124th St- Add 1 lane each direction					✓ ✻
	King Co,Woodin		R.AC-16	Willows Rd- NE 124th St to NE 145th St- construct new facility -4/5 lanes				✓	✓
	Woodinville		R.AC-17 & R.PA-28	SR 202- NE 145th St to SR 522- widen to 5 lanes				✓ ✻	✓ ✻
	Red,K C,Woodin		R.AC-18 & R.PA-28	SR 202 - NE 90th to NE 145th					✓ ✻
	Ren, K C, Issaqu		R.AC-19 & R.IC-5	SR 900 - SR 405 to Edmonds. Additional capacity is not needed					
	Both,S C,Mill Cr		R.AC-20	SR 527/Bothell Everett Hwy - SR 522 to SR 524 - Widen by 1 lane each direction					✓
	Both,Woodin		R.AC-30 & R.PA-25	SR 202 connection across SR 522 to 120th				✓ ✻	✓ ✻
	Bothell		R.AC-34	120th Ave NE - SR 522 to NE 195th (4 lns existing additioal not needed)					

✻ ***Evaluated within another project***

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
		Jurisdiction		*ACTIONS*	5	1	2	3	4
Element #					**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
		Tukwila	R.AC-35	SR 181- S 180th to S 200th					✓
		Tukwila	R.AC-36& R.IC-3	SR 181- 144th to Strander Blvd.					✓ ∗
		Tukwila	R.AC-37	Southcenter Pky - Tukwila Pky to Strander Blvd					✓
19.	**Arterial Interchange Improvements (Matched to fit I-405 Improvements)**								
		Tukwila	R.IC-3 & R.AC-36	SR 181 West Valley Highway/ Interurban See R.AC-36			✓	✓	✓
		Renton	R.IC-4 & R.HOV-43	SR 169 Maple Valley Hwy SR 900 to NE 5th See R.HOV-43			✓ ∗	✓ ∗	✓
		Renton	R.IC-5 & R.AC-19	SR 900/ Park - Lake Washington Blvd to Edmonds. Additional capacity is not needed.					
		Bellevue	R.IC-6	Coal Creek Pkwy I-405 to Factoria Blvd.	✓	✓	✓	✓	✓
		Kirkland, Redmond	R.IC-8	NE 85th St-Kirkland Way to 124th			✓	✓	✓
		Kirkland	R.IC-9	NE 116th- 114th Ave NE to 124th Ave NE			✓	✓	✓
		Kirkland	R.IC-10	NE 124th- 113th Ave NE to 124th Ave NE			✓	✓	✓
		Bothell	R.IC-11 & R.HOV-41	SR 527-228th to SR 524			✓	✓	✓
		Renton	R.IC-12 & R.HOV-33	Port Quendall overpass at SE 44th. See R.HOV-33					
		Kirk,King Co	R.IC-14	New half diamond interchange to/from north at NE 132nd St				✓	✓
		Bothell	R.IC-21	New SR 405 Interchange at 240th Street SE(Bothell)				✓	✓
		Bothell	R.IC-24 & R-40	NE 160th Street-112th Ave to Juanita/Woodinville Wy See R-40			✓ ∗	✓ ∗	✓ ∗
		Bothell	R.!C-25	NE 195th Street-Ross Rd to North Creek Pkwy (additional capacity not needed)					
		Kirkland	R.IC-26 & R.PA-13	NE 132nd - 113th to 124th Ave NE				✓ ∗	✓ ∗
12.	**Collector Distributors (CD) Matched to fit I-405 Improvements**								
		Renton	R.CD-1	SR-167, SR-169, Sunset and SR 900/North Renton;					
		Bellevue	R.CD-2	Coal Creek, SR 90, SE 8th, NE 4th, NE 8th and SR 520;					
		Kirkland	R.CD-3	NE 70th and NE 85th;					
		Kirkland	R.CD-4	NE 116th and NE 132nd;					
		Bothell, King Co	R.CD-5	NE 160th, SR-522 and SR 527					
	HOV (HOV)								
7.	**Committed HOV Projects**								
		Bellevue	HOV-01	I-405 at NE 4th/6th/8th (Bellevue) / Construct new HOV direct access at NE 6th, Improve arterial capacity at NE 4th/8th interchanges	✓	✓	✓	✓	✓
		Bellevue	HOV-02	I-90 (Eastgate) / New I-90 HOV direct access connection to P&R	✓	✓	✓	✓	✓
		WSDOT	HOV-14	I-405 (I-5 Swamp Creek to SR 527)/Construct NB and SB HOV lanes total 6 lanes	✓	✓	✓	✓	✓
		KCDOT	HOV-15	E Lk Samm Pkwy (Iss-Fall City Rd to I-90 on ramp)/Widen to 4/5 lanes + HOV lanes. Outside of Study Area					
		ST	HOV-101	I-405 @ Lind/HOV direct access improvements.				✓	
		ST	HOV-102, R.HOV-58 & R.PA-1	Woodinville Arterial Enhancements/HOV arterial enhancements	✓	✓	✓	✓	✓
		Renton	R.HOV-32	Between Sunset and SR-900 /Park Ave interchange in Renton	✓	✓	✓	✓	✓
		Renton	R.HOV-33 & R.IC-12	NE 44th I/C - HOV Direct Access and Arterial Improvements(Assumes Port Quendall)	✓	✓	✓	✓	✓
		Kirkland	R.HOV-61	NE 85th				✓	
		Bothell	R.HOV-62	SR 522 Campus Access	✓	✓	✓	✓	✓
		Bothell	R.HOV-63	SR 527	✓	✓	✓	✓	✓
		Tukwila	R.HOV-64	Southcenter (In-Line Station). In line station at this location has been dropped.					
		ST	R.HOV-66	I-405 at NE 128th St/HOV Direct Access Improvements	✓	✓	✓	✓	✓

∗ ***Evaluated within another project***

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
		Jurisdiction	*ACTIONS*		5	1	2	3	4
Element #					**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
7.	**HOV Interchange Ramps (Direct Access)**								
	Tukwila		R.HOV-25	SR 5 I/C @ Tukwila Fwy to Fwy HOV ramps,			✓	✓	✓
	Renton		R.HOV-26	SR 167 I/C Fwy to Fwy HOV ramps,			✓	✓	✓
	Bellevue		R.HOV-27	SR 90 I/C Fwy to Fwy HOV ramps,			✓	✓	✓
	Bellevue		R.HOV-28	SR 520 Fwy to Fwy HOV ramps,			✓	✓	✓
	Bothell		R.HOV-29	SR 522 Fwy to Fwy HOV Ramps			✓	✓	✓
	Sno. Co.		R.HOV-30	SR 5 I/C @ Swamp Creek Fwy HOV ramps.			✓	✓	✓
	Newcastle		R.HOV-65	112th St SE (In-Line Station)			✓		
6.	**Arterial HOV**								
	Bellevue		R.HOV-36	Coal Creek Pkwy from I-405 to Forest Drive		✓	✓	✓	
	Bellevue		R.HOV-37	NE 8th Street from I-405 to 120th Ave NE		✓	✓	✓	
	Kirk, Redmond		R.HOV-38	NE 85th St from Kirkland Way to 148th Ave NE Vicinity		✓	✓	✓	
	Kirkland		R.HOV-39	NE 116th from 115th Ave NE to 124th Ave NE		✓	✓	✓	
	Kirkland		R.HOV-40	NE 124th from 113th Ave NE to 132 Ave NE		✓	✓	✓	
	Bothell		R.HOV-41 & R.IC-11	SR 527 From SE 228th St to SR 524		✓	✓ ⁎	✓ ⁎	
	Renton		R.HOV-43 & R.IC-4	SR 169 from SR 405 to Riverview Park Vicinity - HOV/Transit Preferential treatment.		✓	✓	✓	
	Renton		R.HOV-44	SW 27th St Corridor in Renton from Oaksdale Ave to SR 167		✓	✓	✓	
	Redmond		R.HOV-47	Avondale Rd from Novelty Hill Rd to Avondale Way/ Construct SB HOV lane		✓	✓	✓	
	Renton, King Co		R.HOV-48	SW 43 St from SR 167 to 140 Ave SE		✓	✓	✓	
	Renton		R.HOV-49	Logan Ave N/N 6 St from S 3 St to Park Dr, Transit Signal Priority		✓	✓	✓	
	Renton		R.HOV-51	Park Dr/Sunset Blvd from Garden Ave to Duvall Ave NE, Que Bypass'		✓	✓	✓	
	Kenmore		R.HOV-53 & R.PA-11	68 Ave NE (Simonds Rd to SR 522) - Construct NB HOV lane		✓	✓	✓	
	Redmond		R.HOV-55	Willows Rd (Redmond Wy to NE 124 St)		✓	✓	✓	
	Kirkland, Bellevue		R.HOV-56	Lake Washington Blvd (SR 520 to Yarrow Bay) - HOV lanes		✓	✓	✓	
	Kirkland		R.HOV-57	NE 68 St/NE 72 Pl (I-405 Vicinity) Que Bypass'		✓	✓	✓	
	Bothell, Woodin Renton, King Co		R.HOV-58, HOV-102 & R.PA-1 R.HOV-59	SR 522 (I-405 to SR 527 - Bothell) WB HOV Que Bypass - See HOV-102 Benson Rd - I-405 to SE Carr Rd - No Project					
	Bellevue		R.HOV-60	Bellevue Way - I-90 to South Bellevue Park and Ride Vicinity		✓	✓	✓	
23.	**Freight (F)**								
	Renton		R.FR-10 & R.BI-1	Modify SR 167 Interchange for East to South Freight movements		✓ ⁎	✓ ⁎	✓ ⁎	
	Various		R.FR-11	Improve truck flow with ITS		✓	✓	✓	
	Various		R.FR-23	Remote area for overnight freight parking and staging for early morning deliveries		✓	✓	✓	
	Various		R.FR-26	Full depth shoulders for truck usage on key freeways and arterials)		✓	✓	✓	
	Various		R.FR-27	Traveler Information System (TIS) on SR 167 for I-405 "options"		✓	✓	✓	
	Various		R.FR-28	TIS on I-5 for SR 18/I-90; and 164th to I-405; and South 200th to I-405		✓	✓	✓	
	Various		R.FR-29	Centralized fax/radio for real time congestion reporting for dispatchers and truck drivers. Leverage WSDOT video linkages (e.g., a "T-911" number).		✓	✓	✓	
	Various		R.FR-30	Hours of operation and service periods optimized—"JIT" redefined for applicable service sectors (e.g. restaurants)		✓	✓	✓	
	Various		R.FR-32	Light cargo delivery using Sound Transit service		✓	✓	✓	
22.	**Intelligent Transportation Systems (ITS)**								
	Various		ITS-1	Add Camera Coverage to decrease TMC blind spots		✓	✓	✓	✓
	Various		ITS-2	Complete Ramp Metering		✓	✓	✓	✓
	Various		ITS-4	Dual Lane Ramp Metering		✓	✓	✓	✓

⁎ ***Evaluated within another project***

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

						Alternatives				
		Jurisdiction		*ACTIONS*		5	1	2	3	4
Element #						**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
		Various		ITS-5	Increased Incident Response		✓	✓	✓	✓
		Various		ITS-6	Traffic adaptive control on arterials		✓	✓	✓	✓
		Various		ITS-7	TIS before all major decision points		✓	✓	✓	✓
		Various		ITS-8	WSDOT support of in-vehicle traffic information		✓	✓	✓	✓
		Various		ITS-9	Arterial camera coverage		✓	✓	✓	✓
4.	**High Capacity Transit (Physically Separated, Fixed Guideway HCT)**									
		Tuk. & Renton		T.HCT-1	HCT- SeaTac to Renton CBD		✓	✓		
		Renton		T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)		✓	✓		
		Ren< New & Bel		T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria		✓	✓		
		Bell & Issa		T.HCT-4	HCT - Factoria To Issaquah		✓	✓		
		Bellevue		T.HCT-5	HCT Factoria to Downtown Bellevue		✓	✓		
		Bell & Red		T.HCT-6	HCT - Bellevue to Redmond		✓	✓		
		Bell & Kirk		T.HCT-7	HCT- Bellevue to Totem Lake		✓	✓		
		Kirk & King Co		T.HCT-8	HCT - Totem Lake to Bothell		✓	✓		
		Various		T.HCT-9	HCT - Bothell to Lynnwood		✓	✓		
4.	**High Capacity Transit (Bus rapid transit [BRT] operating improved access HOV lanes on the existing freeway system)**									
		Tuk. & Renton		T.HCT-1	HCT- SeaTac to Renton CBD				✓	
		Renton		T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)				✓	
		Ren< New & Bel		T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria				✓	
		Bell & Issa		T.HCT-4	HCT - Factoria To Issaquah				✓	
		Bellevue		T.HCT-5	HCT Factoria to Downtown Bellevue				✓	
		Bell & Red		T.HCT-6	HCT - Bellevue to Redmond				✓	
		Bell & Kirk		T.HCT-7	HCT- Bellevue to Totem Lake				✓	
		Kirk & King Co		T.HCT-8	HCT - Totem Lake to Bothell				✓	
		Various		T.HCT-9	HCT - Bothell to Lynnwood				✓	
4.	**High Capacity Transit Stations**									
		Sea-Tac		HCT.TS-1	Sea-Tac (Outside of Study Area)					
		Tukwila		HCT.TS-2	Southcenter		✓	✓	✓	
		Tukwila & Renton		HCT.TS-3	Tukwila (Longacres)		✓	✓		
		Renton		HCT.TS-4	Downtown Renton		✓	✓	✓	
		Renton		HCT.TS-5	North Renton		✓	✓		
		Renton		HCT.TS-6	Port Quendall		✓	✓	✓	
		Bellevue		HCT.TS-7	Factoria		✓	✓	✓	
		Bellevue		HCT.TS-8	Bellevue Transit Center		✓	✓	✓	
		Bellevue		HCT.TS-9	Bellevue Library		✓	✓		
		Bell & Kirk		HCT.TS-10	SR 520/Northup Way		✓	✓	✓	
		Kirkland		HCT.TS-11	Downtown Kirkland (NE 85th Street)		✓	✓	✓	
		Kirkland		HCT.TS-12	Totem Lake		✓	✓	✓	
		Woodinville		HCT.TS-13	NE 145th Street		✓	✓		
		Woodinville		HCT.TS-14	Woodinville		✓	✓		
		Bothell		HCT.TS-15	NE 195th		✓	✓	✓	

∗ Evaluated within another project

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

						Alternatives				
		Jurisdiction		*ACTIONS*		5	1	2	3	4
Element #						No Action	HCT/TDM	Mixed Mode with HCT/Transit Emphasis	Mixed Mode	General Capacity
		Bothell		HCT.TS-16	Canyon Park		✓	✓	✓	
		Sno County		HCT.TS-17	164th Street AW (AshWay)		✓	✓		
		Bellevue		HCT.TS-18	Eastgate		✓	✓	✓	
		King County		HCT.TS-19	Lakemont		✓	✓		
		Issaquah		HCT.TS-20	Issaquah 9Outside of Study area)					
		Bellevue		HCT.TS-21	132nd Avenue NE		✓	✓		
		Bellevue		HCT.TS-22	148th Avenue NE		✓	✓		
		Redmond		HCT.TS-23	Overlake (NE 40th Street)		✓	✓	✓	
		Redmond		HCT.TS-24	Redmond Town Center		✓	✓	✓	
		Redmond		HCT.TS-25	Bear Creek		✓	✓		
		Mercer Island		HCT.TS-26	Mercer Island		✓	✓	✓	
New	**Transit Service (TS)**									
		Various		TS-0	Twenty percent more service than in the proposed 6-year plans for sound Transit, METRO and Community Transit	✓	✓	✓	✓	✓
		Various		TS-1	Fifty percent more service assumed in the current 6-year plans for Sound Transit, METRO and Community Transit					✓
3.	**Transit Service (TS)**									
		Various		TS-2	Twice the service in the proposed 6-year plans for Sound Transit, METRO and Community Transit		✓	✓	✓	
8.	**Park and Rides (PR)**									
		Renton		T.PR-3	Renton Highlands	✓	✓	✓	✓	✓
		Tukwila & Ren		T.PR-6	Tukwila Commuter Rail (Longacres)	✓	✓	✓	✓	✓
		K C		T.PR-8	SR 169 and 140th Place SE		✓	✓	✓	
		K C		T.PR-9	Petrovitsky Rd and 157th Ave SE		✓	✓	✓	
		K C		T.PR-10	140th Ave SE and SE 192nd		✓	✓	✓	
		K C		T.PR-11	SR 515 and SE 208th		✓	✓	✓	
		Kent & Renton		T.PR-12	SR 167 and SW 43rd		✓	✓	✓	
		Kent & Renton		T.PR-13	SR 167 and 84th Ave		✓	✓	✓	
		Redmond		T.PR-17	Willows Rd @ NE 100th		✓	✓	✓	
		Redmond		T.PR-18	SR 202 @ NE 100th		✓	✓	✓	
		Bell & Kirk		T.PR-20	South Kirkland	✓	✓	✓	✓	✓
		Redmond		T.PR-21	Overlake	✓	✓	✓	✓	✓
		Bellevue		T.PR-22	South Bellevue	✓	✓	✓	✓	✓
		Bellevue		T.PR-23	Newport (112th Ave. SE)	✓	✓	✓	✓	✓
		KC		T.PR-24	NE 160th/Brickyard Rd	✓	✓	✓	✓	✓
		Bothell		T.PR-25	Canyon Park (SR 405 and SR 527)	✓	✓	✓	✓	✓
		KC		T.PR-26	SR 202 @ NE 145th		✓	✓	✓	
		Tukwila		T.PR-30	Tukwila	✓	✓	✓	✓	✓
		Kirkland		T.PR-31	Houghton	✓	✓	✓	✓	✓
		Kirkland		T.PR-32	Kingsgate	✓	✓	✓	✓	✓
		Medina		T.PR-33	Evergreen Point	✓	✓	✓	✓	✓
		Bellevue		T.PR-34	Wilburton	✓	✓	✓	✓	✓
		King County		T.PR-35	Lakemont	✓	✓	✓	✓	✓
		Redmond		T.PR-36	Rendmond	✓	✓	✓	✓	✓
		Redmond		T.PR-37	Bear Creek	✓	✓	✓	✓	✓
		Bothell		T.PR-38	Bothell	✓	✓	✓	✓	✓

∗ Evaluated within another project

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
	Jurisdiction		*ACTIONS*		5	1	2	3	4
Element #					**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
	Kenmore		T.PR-39	Northshore	✓	✓	✓	✓	✓
	Kenmore		T.PR-40	Kenmore	✓	✓	✓	✓	✓
	Woodinville		T.PR-41	Woodinville	✓	✓	✓	✓	✓
	Mercer Island		T.PR-42	Mercer Island	✓	✓	✓	✓	✓
	Bellevue		T.PR-43	Eastgate	✓	✓	✓	✓	✓
9.	**Transit Centers (TC)**								
	Renton		T.TC-6	Downtown Renton	✓	✓	✓	✓	✓
	Bellevue		T.TC-8	Downtown Bellevue	✓	✓	✓	✓	✓
	Redmond		T.TC-9	Overlake	✓	✓	✓	✓	✓
	Kirkland		T.TC-12	Downtown Kirkland	✓	✓	✓	✓	✓
	Kirkland		T.TC-14	Totem Lake	✓	✓	✓	✓	✓
1.	**TDM (TDM)**								
	Various		TDM-1	TDM Package		✓	✓	✓	✓
			TDM-2	Expanded TDM Package- Regional Congestion Pricing		✓			
	Pedestrian and Bicycle Facilities (P&B)								
21.	**I-405 Crossings**								
	Bellevue		NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks		✓	✓	✓	✓
	Bothell		NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility		✓	✓	✓	✓
	King County		NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder		✓	✓	✓	✓
	Sno. County		NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder		✓	✓	✓	✓
	Renton		NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder		✓	✓	✓	✓
	Renton		NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder		✓	✓	✓	✓
	Bothell		NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike overcrossing of I-405		✓	✓	✓	✓
	Bothell		NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility		✓	✓	✓	✓
21.	**Pedestrian/Bicycle Connections**								
	Bellevue,Kirkland		NM.P&B-2	BNSF Right of Way - SE 8th to Totem Lake - Add ped/bike facility.		✓	✓	✓	
	Bellevue		NM.P&B-4	Lk Washington Blvd - SR 405 to SE 60th - Add ped/bike facilities		✓	✓	✓	
	Bothell		NM.P&B-5	North Creek Trail Link - 240th to 232nd - Add ped/bike trail.		✓	✓	✓	
	Bel,Nwcas,Ren		NM.P&B-6	Lk Washington Blvd/112th - SE 60th to May Creek I/C - Add ped/bike facility		✓	✓	✓	
	Renton		NM.P&B-14	Cedar River Trail S. Extension - I-405 to Burnett Ave - Add ped/bike facilities		✓	✓	✓	
	Renton		NM.P&B-15	Cedar River Trail/Lake Washington Blvd Connector - Cedar River Trail to Lk Wash Blvd Loop - Add ped/bike facilities		✓	✓	✓	
	Renton		NM.P&B-16	Cedar-Duwamish Trail Connection - I-405 to Interurban Ave. S. - Add ped/bike facilities		✓	✓	✓	
	Renton		NM.P&B-17	I-405/SR-167 trail connection - Lind Ave. SE to Talbot Rd S. - Add trail connection		✓	✓	✓	
	Renton/Tukwila		NM.P&B-18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities		✓	✓	✓	✓
	Tukwila		NM.P&B-19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes		✓	✓	✓	✓
17.	**Arterial Committed Projects**			(Note: ID numbers are same as ETP ID's					
	Bothell, Snohomish C		R.AC-21	120th NE/39th SE - NE 95th to Maltby Rd - 4/5 lanes including new connection	✓	✓	✓	✓	✓
	Bellevue		R-08	NE 29th Pl (148th Ave NE to NE 24th St)/Construct new 2-lane road	✓	✓	✓	✓	✓

∗ Evaluated within another project

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

				Alternatives				
	Jurisdiction	*ACTIONS*		5	1	2	3	4
Element #				**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
	Snohomish Co.	R-10	SR 524 (24 St SW to SR 527)--- Widen to 4/5 lanes including sidewalks, bike lanes	✓	✓	✓	✓	✓
	Bothell	R-13	Beardslee Blvd (Main St to I-405)Widen to 3 lanes+CGS (Project does not add capacity)					
	Joint	R-17 & R-17(10)	I-90/SR 900 Interchange and SR 900 improvements--- Interchange reconfiguration. Project is outside of the Study Area					
	Issaquah	R-18	Issaquah bypass (Issaquah-Hobart Rd to I-90)-- Construct new 4/5 lanes with separated ped/bike trail. Project is outside of the Study Area.					
	Kirkland	R-21	NE 120 St (Slater Ave to 124 Ave NE)--- Construct new 3-lane roadway with ped/bike facilities	✓				
	Redmond/ WSDOT	R-25	SR 202 Corridor Improvements(East Lake Sammamish Pkwy to Sahalee Way)--- Widen to 3/5 lanes; intersection improvements with bike/ped facilities	✓	✓	✓	✓	✓
	Redmond	R-26	NE 90 St (Willows Rd to SR 202)--- Construct new 4/5 lanes + bike facilities	✓	✓	✓	✓	✓
	Redmond	R-28	West Lake Sammamish Parkway (Leary Way to Bel-Red Rd)--- Widen to 4/5 lanes + CGS, bike lanes	✓	✓	✓	✓	✓
	Renton	R-36	Oakesdale Ave SW (SW 31st to SW 16th)--- Construct new 5 lane roadway with CGS	✓	✓	✓	✓	✓
	WSDOT	R-38	SR 522 (SR 9 to SR 2)--- Widen to 4 lanes					
	KCDOT	R-39 & R.AC-2	140 Ave SE (SR 169 to SE 208 St)--- Widen to 5 lanes SR 169 to SE 196 St, widen for turn channels on SE 196. Combines 2 King County CIP projects. A major North-South arterial which serves the Soos Creek Plateau and Fairwood.	✓	✓	✓	✓	✓
	KCDOT	R-40 & R.IC-24	Juanita-Woodinville Way (NE 145 St to 112th Ave NE) Widen to 5 lanes + CGS, walkway/pathway	✓	✓	✓	✓	✓
	KCDOT	R-41	East Lake Sammamish Pkwy (Issaquah-Fall City Rd to SE 56 St)--- Widen 4/5 lanes including bike facilities. Construct CGS; interconnect traffic signals. Project is outside of the Study Area.					
	Issaquah	R-42	Sammamish Plateau Access Road (I-90 to Iss.-Pine Lake Rd)-- Prepare EIS, construct new 5-lane arterial w/ CGS, bike lanes. Project is outside of the Study Area.					
	Sammamish	R-44	228 Ave SE (SE 24th to NE 8 St)--- Widen to 4/5 lanes + CGS, bike lanes. Planned in 2 phases. Project is outside of the Study Area.					
	KCDOT	R-45	Issaquah-Fall City Rd (Issaquah-Pine Lake Rd to Klahanie Dr) - Phase II & III--- Widen to 4/5 lanes + CGS, bike lanes. Project is outside of the Study Area.					
	KCDOT	R-47	NE 124 St (Willows Rd to SR 202)--- Widen to 4/5 lanes + CGS, bike facilities; traffic signal.	✓	✓	✓	✓	✓
	KCDOT	R-48	Avondale Rd (Tolt Pipeline to Woodinville-Duvall Rd)--- Widen to 3 lanes + walkway/pathway (Project does not add capacity)					
	Woodinville	R-51	Woodinville-Snohomish Rd/140 Ave NE (NE 175 St to SR 522)--- Widen to 4/5 lanes + CGS, bike lanes	✓	✓	✓	✓	✓
	KCDOT	R-52	Woodinville-Duvall Rd (NE 171st St to Avondale Rd)--- Widen to 5 lanes + shoulders (without widening towards Woodinville the added capacity can't be used)					
	Bellevue	R-101	150th Ave SE---Widen to 7 lanes from SE 36th to SE 38th; add turn lanes	✓	✓	✓	✓	✓
	Redmond	R-111 & R.AC-15	Willows Rd Corridor Improvements-- Channelization of Willows Rd/Redmond Way intersection and widening of Willows Rd from NE 116th to NE 124th	✓	✓	✓	✓	✓
	Snohomish Co.	R-117	39th Ave SE Realignment at SR 524 and York Rd--- Construct 4-way intersection to replace 2 offset intersections	✓	✓	✓	✓	✓
17.	**Planned Arterial Projects**							
	Sound Transit	R.PA-1, HOV-102 & R.HOV-58	SR 522 (Woodinville to Bothell)--- HOV enhancements (ETP 246) See HOV-102					
	Bellevue	R.PA-2	148 Ave SE (SE 24 St to SE 28 St) New SB lane from SE 24 St to the WB I-90 on-ramp (ETP 203)			✓	✓	✓
	Bothell	R.PA-3	SR 522 Multimodal Corridor Project--- Widen SR-522 mostly within existing ROW to provide transit lanes, safety improvements, consolidated driveways & left turn lanes; and sidewalks. (ETP R-107)			✓	✓	✓
	Bothell	R.PA-4	SR 524 (SR 527 to Bothell City Limit)--- Widen to 5 lanes + CGS, bike facilities (class III) (ETP R-11)			✓	✓	✓
	KCDOT	R.PA-5	SE 212 Way/SE 208 St (SR 167 to Benson Rd/SR 515)--- Widen to 6 lanes + bike facilities, Transit/HOV preferential treatment, turn channels. (ETP R-46)			✓	✓	✓
	KCDOT	R.PA-6	Petrovitsky Rd (143 Ave SE to 151 Ave SE) --- Widen to 5 lanes + CGS, bike lanes, traffic signal, interconnect (ETP 265). Project has already been constructed.					
	KCDOT	R.PA-7	Bear Creek Arterial (NE 80 St to Novelty Hill Rd)--- Corridor study and construction of new 3 lane arterial (ETP 141). Project is outside the study area					
	KCDOT	R.PA-8	NE 124/128 St (SR 202 to Avondale Rd)--- Widen to 4/5 lanes including bike & equestrian facilities (ETP 164)			✓	✓	✓
	KCDOT	R.PA-9	SE 208 St (116 Ave SE to 132 Ave SE)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signal (ETP 263). Project has already been constructed.					

∗ Evaluated within another project

APPENDIX B

I-405 Corridor Program EIS Alternatives Project Matrix

					Alternatives				
		Jurisdiction		*ACTIONS*	5	1	2	3	4
Element #					**No Action**	**HCT/TDM**	**Mixed Mode with HCT/Transit Emphasis**	**Mixed Mode**	**General Capacity**
		KCDOT	R.PA-10	NE 132 St Extension (132 Ave NE to Willows Rd Ext.)---- Construct new 3 lane arterial with CGS, bike lanes (ETP 61)			✓	✓	✓
		Kenmore/KCDOT	R.PA-11 & R.HOV-53	68 Ave NE (Simonds Rd to SR 522)--- Construct NB HOV lane total of 5/6 lanes (ETP 22)			✓ ✻	✓ ✻	✓
		Kirkland	R.PA-12	124 Ave NE (NE 85 St to Slater Rd NE)--- Widen to 3 lanes (s. of NE 116th St, 5 lanes n. of NE 116th St with ped/bike facilities (ETP R-23)			✓	✓	✓
		Kirkland	R.PA-13 & R.IC-26	NE 132 St (100 Ave NE to 116 Way NE)--- Widen to 3 lanes + CGS, Bike lane (ETP R-124)			✓	✓	✓
		Kirkland	R.PA-14	NE 100 St (117 Ave NE to Slater Ave) --- Construct bike/pedestrian/emergency Vehicle overpass across I-405 (ETP 309)			✓	✓	✓
		Newcastle	R.PA-15	Coal Creek Pkwy (SE 72 St to Renton City Limits)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signals (ETP R-24)			✓	✓	✓
		Redmond	R.PA-16	Redmond 148th Ave NE Corridor - 3 projects--- Turn lane and channelization improvements along corridor – BROTS;			✓	✓	✓
		Redmond	R.PA-17	Bear Creek Pkwy--- Construct new 162nd Ave NE arterial and new 72nd St arterial w/ bike/ped and CSG; widen Bear Creek Pkwy (ETP R-110)			✓	✓	✓
		Redmond	R.PA-18	Union Hill Rd (Avondale Rd to 196 Ave NE)--- Widen to 4/5 lanes with bike facilities (ETP R-27)			✓	✓	✓
		Renton	R.PA-19	Duvall Ave NE (NE 4 St to NE 25 Court -City Limits)--- Widen to 5 lanes + CGS, bikeway (ETP R-31)			✓	✓	✓
		Renton	R.PA-20	Oakesdale Ave SW (Monster Rd to SR 900) Replace Monster Rd Bridge; widen to 4/5 lanes +Bike Lanes + CGS (ETP R-35)			✓	✓	✓
		Renton	R.PA-21	Rainier Ave / Grady Way (intersection)-- Grade separation			✓	✓	✓
		Renton	R.PA-22	SW Grady Way (SR 167 to SR 515)--- Rechannelize and modify signals for a continuous eastbound lane (ETP R-37)			✓	✓	✓
		Renton	R.PA-23	SR 167 at East Valley Road--- New southbound off-ramp and signalization at East Valley Road (ETP 255)			✓	✓	✓
		Renton/ KCDOT	R.PA-24	Soos Creek Regional Links--- Placeholder for Trans-Valley Study (ETP R-115)			✓	✓	✓
		Woodinville	R.PA-25 & R.AC-30	SR 522 Interchange Package(SR 522/SR 202 &SR522/195th St)--- Access improvements and new freeway ramps (ETP R-53) (See R.AC-30)			✓	✓	✓
		Woodinville	R.PA-26	SR202 Corridor Package (SR202/148th Ave & SR202/127th Place)--- Intersection improvements (ETP R-54)			✓	✓	✓
		WSDOT	R.PA-27	SR 520/SR 202 Interchange --- Complete interchange by constructing a new ramp and thru lane on 202 to SR 520 (ETP R-29)			✓	✓	✓
		WSDOT	R.PA-28 & R.AC-17	SR 202 / 140 Place NE (NE 124 St to NE 175 St)--- Widen 4/5 lanes (ETP R-43) (See R.AC-17, 18)			✓	✓	✓
		WSDOT	R.PA-29	SR 202 (Sahalee Way to Bear Creek-Sammamish Arterial)-- Widen to 4/5 lanes (ETP 152). Project is outside the Study Area.					

✻ ***Evaluated within another project***

APPENDIX C
Communications and Coordination

No specific correspondence was received. However, general coordination is presented in Section 3.3 of this report.

APPENDIX D
Wetland Impacts by Project Type

"No Action"									
Element#	Agency	ID	Project	Number of WLs Impacted	Number of Cat. 1 WLs impacted	Total Acreage of WL Fill	Avoidance within ROW possible?	Avoidance with another alignment possible?	New Impervious Surface
10.	**Committed Freeway Projects**								
	WSDOT	R-55	I-405/SR 167 Interchange/Construct new southbound I-405-to-southbound SR 167 ramp modification.	0					0.7
			Total =	0	0	0			0.7
19.	**Arterial Interchange Improvements (Matched to fit I-405 Improvements)**								
	Bellevue	R.IC-6	Coal Creek Pkwy I-405 to Factoria Blvd.	0					1.3
			Total =	0	0	0			1
7.	**Committed HOV Projects**								
	Bellevue	HOV-01	I-405 at NE 4th/6th/8th (Bellevue) / Construct new HOV direct access at NE 6th, Improve arterial capacity at NE 4th/8th interchanges	0					6.1
	Bellevue	HOV-02	I-90 (Eastgate) / New I-90 HOV direct access connection to P&R	0					6.3
	WSDOT	HOV-14	I-405 (I-5 Swamp Creek to SR 527)/Construct NB and SB HOV lanes total 6 lanes	4	0	0.3	N	-	11.5
	ST	HOV-102, R.HOV.58 & R.PA.1	Woodinville Arterial Enhancements/HOV arterial enhancements	0					1.0
	Renton	R.HOV-32	Between Sunset and SR-900 /Park Ave interchange in Renton	0					6.0
	Renton	R.HOV-33 & R.IC.12	NE 44th I/C - HOV Direct Access and Arterial Improvements(Assumes Port Quendall)	3	1	1.1	N	-	9.1
	Kirkland	R.HOV-61	NE 85th	0					3.5
	Bothell	R.HOV-62	SR 522 Campus Access	10	1	0.2	N	-	5.7
	Bothell	R.HOV-63	SR 527	0					1.0
	ST	R.HOV-66	I-405 at NE 128th St/HOV Direct Access Improvements	3	0	0.1	N	-	6.3
			Total =	20	2	2			57
8.	**Park and Rides (PR)**		locations not known						
	Renton	T.PR-3	Renton Highlands	?					5.0
	Tukwila & R	T.PR-6	Tukwila Commuter Rail (Longacres)	?					5.0
	Bell & Kirk	T.PR-20	South Kirkland	?					5.0
	Redmond	T.PR-21	Overlake	?					5.0
	Bellevue	T.PR-22	South Bellevue	?					5.0
	Bellevue	T.PR-23	Newport (112th Ave. SE)	?					5.0
	KC	T.PR-24	NE 160th/Brickyard Rd	?					5.0
	Bothell	T.PR-25	Canyon Park (SR 405 and SR 527)	?					5.0
	Tukwila	T.PR-30	Tukwila	?					5.0
	Kirkland	T.PR-31	Houghton	?					5.0
	Kirkland	T.PR-32	Kingsgate	?					5.0
	Medina	T.PR-33	Evergreen Point	?					5.0
	Bellevue	T.PR-34	Wilburton	?					5.0
	King County	T.PR-35	Lakemont	?					5.0
	Redmond	T.PR-36	Rendmond	?					5.0
	Redmond	T.PR-37	Bear Creek	?					5.0
	Bothell	T.PR-38	Bothell	?					5.0
	Kenmore	T.PR-39	Northshore	?					5.0
	Kenmore	T.PR-40	Kenmore	?					5.0
	Woodinville	T.PR-41	Woodinville	?					5.0
	Mercer Islar	T.PR-42	Mercer Island	?					5.0
	Bellevue	T.PR-43	Eastgate	?					5.0
			Total =	0	0	0			110
9.	**Transit Centers (TC)**								
	Renton	T.TC-6	Downtown Renton	?					2.0
	Bellevue	T.TC-8	Downtown Bellevue	?					2.0
	Redmond	T.TC-9	Overlake	?					2.0

	Kirkland	T.TC-12	Downtown Kirkland	?					2.0
	Kirkland	T.TC-14	Totem Lake	?					2.0
			Total =	0	0	0			10
17.	**Arterial Committed Projects**								
	Bothell, Snd	R.AC-21	120th NE/39th SE - NE 95th to Maltby Rd - 4/5 lanes including new connection	3	1	0.6	N		7.8
	Bellevue	R-08	NE 29th Pl (148th Ave NE to NE 24th St)/Construct new 2-lane road	0					4.5
	Snohomish	R-10	SR 524 (24 St SW to SR 527)--- Widen to 4/5 lanes including sidewalks, bike lanes	11	4	4.2	N		22.9
	Kirkland	R-21	NE 120 St (Slater Ave to 124 Ave NE)--- Construct new 3-lane roadway with ped/bike facilities	0					
	Redmond/ V	R-25	SR 202 Corridor Improvements(East Lake Sammamish Pkwy to Sahalee Way)--- Widen to 3/5 lanes; intersection improvements with bike/ped facilities	2	2	0.8	N		9.3
	Redmond	R-26	NE 90 St (Willows Rd to SR 202)--- Construct new 4/5 lanes + bike facilities	2	2	0.4	Y		4
	Redmond	R-28	West Lake Sammamish Parkway (Leary Way to Bel-Red Rd)--- Widen to 4/5 lanes + CGS, bike lanes	6	2	0.75	N		4.4
	Renton	R-36	Oakesdale Ave SW (SW 31st to SW 16th)--- Construct new 5 lane roadway with CGS	1	0	0.2	N		3
	KCDOT	R-39 & R.AC.2	140 Ave SE (SR 169 to SE 208 St)--- Widen to 5 lanes SR 169 to SE 196 St, widen for turn channels on SE 196. Combines 2 King County CIP projects. A major North-South arterial which serves the Soos Creek Plateau and Fairwood.	5	2	1.5	N		19.5
	KCDOT	R-40 & R.IC-24	Juanita-Woodinville Way (NE 145 St to 112th Ave NE) Widen to 5 lanes + CGS, walkway/pathway	0					2.1
	KCDOT	R-47	NE 124 St (Willows Rd to SR 202)--- Widen to 4/5 lanes + CGS, bike facilities; traffic signal.	1	1	0.2	N		5.5
	Woodinville	R-51	Woodinville-Snohomish Rd/140 Ave NE (NE 175 St to SR 522)--- Widen to 4/5 lanes + CGS, bike lanes	0					13.6
	Bellevue	R-101	150th Ave SE---Widen to 7 lanes from SE 36th to SE 38th; add turn lanes	0					3.08
	Redmond	R-111 & R.AC.15	Willows Rd Corridor Improvements-- Channelization of Willows Rd/Redmond Way intersection and widening of Willows Rd from NE 116th to NE 124th	6	3	2	N		0.7
	Snohomish	R-117	39th Ave SE Realignment at SR 524 and York Rd--- Construct 4-way intersection to replace 2 offset intersections	0					1.1
			Total =	37	17	11			101
			Alternative Total=	**57**	**19**	**12.4**			**280**

Alternative 1 - "HCT/TDM"									
Element#	Agency	ID	Project	Number of WLs Impacted	Number of Cat. 1 WLs impacted	Total Acreage of Fill	Avoidance within ROW possible?	Avoidance with another alignment possible?	New Impervious Surface
10.	**Basic I-405 Improvement Projects**								
	Renton	R.BI.1 & R.FR-10	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167	2	1	0.1	N	N	2.8
	Kirkland	R.BI.2	Continue NB climbing Lane from NE 70th to NE 85th and continue as auxiliary Lane to NE 116th	0					4.0
	Kirkland	R.BI.3	SB auxiliary Lane NE 124th to NE 85th	0					2.1
	Bellevue	R.BI.4	I-90 / Coal Creek Interchange	0					10.7
	Both,King C	R.BI.5	SB SR 522 to 124th continue climbing lane as an auxiliary lane	1	0	0.3	N	-	4.0
	Bothell	R.BI.6	NB auxiliary lane Sr 522 to SR 527	0					4.8
	Renton	R.BI.7	Kennydale Hill climbing lane - SR 900 to 44th - NB 900 to 30th, SB 44th - 30th	0					3.4
	Bellevue	R.BI.8	I-90 to Bellevue SB HOV direct connection to I-90 west	0					1.0
	Bellevue	R.BI.9	NB auxiliary lane I-90 to NE 8th	1	0	0.1	N	N	3.2
	Bellevue	R.BI.10	Increase SR 405 to Eastbound SR 520 Ramp capacity	0					8.0
	Renton	R.BI.14	NB Auxilliary Lane I-5 to SR 167	2	1	0.1	N	-	5.1
	Various	R.FR-24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)	NA					
			Total =	6	2	1			49
6.	**Arterial HOV**								
	Bellevue	R.HOV-36	Coal Creek Pkwy from I-405 to Forest Drive	0					0.2
	Bellevue	R.HOV-37	NE 8th Street from I-405 to 120th Ave NE	0					0.5
	Kirk, Redmo	R.HOV-38	NE 85th St from Kirkland Way to 148th Ave NE Vicinity	4	1	0.3	N	N	2.3
	Kirkland	R.HOV-39	NE 116th from 115th Ave NE to 124th Ave NE	0					1.0
	Kirkland	R.HOV-40	NE 124th from 113th Ave NE to 132 Ave NE	0					0.7
	Bothell	R.HOV-41	SR 527 From SE 228th St to SR 524	7	3	1	N	-	3.8
	Renton	R.HOV-43+ R.IC-4	SR 169 from SR 405 to Riverview Park Vicinity - HOV/Transit Preferential treatment.	0					1.4
	Renton	R.HOV-44	SW 27th St Corridor in Renton from Oaksdale Ave to SR 167	3	3	2	N	Y	6.7
	Redmond	R.HOV-47	Avondale Rd from Novelty Hill Rd to Avondale Way/ Construct SB HOV lane	0					1.5
	Renton, Kin	R.HOV-48	SW 43 St from SR 167 to 140 Ave SE	0					4.1
	Renton	R.HOV-49	Logan Ave N/N 6 St from S 3 St to Park Dr, Transit Signal Priority	0					0.0
	Renton	R.HOV-51	Park Dr/Sunset Blvd from Garden Ave to Duvall Ave NE, Que Bypass'	0					0.5
	Kenmore	R.HOV-53 & R.PA.11	68 Ave NE (Simonds Rd to SR 522) - Construct NB HOV lane	1	1	0.1	N	-	0.5
	Redmond	R.HOV-55	Willows Rd (Redmond Wy to NE 124 St)	0					0.7
	Kirkland, Be	R.HOV-56	Lake Washington Blvd (SR 520 to Yarrow Bay) - HOV lanes	1	1	0.3	N	-	1.3
	Kirkland	R.HOV-57	NE 68 St/NE 72 Pl (I-405 Vicinity) Que Bypass'	0					0.2
	Bellevue	R.HOV-60	Bellevue Way - I-90 to South Bellevue Park and Ride Vicinity	0					0.3
			Total =	16	9	4			26
23.	**Freight (F)**								
	Various	R.FR-11	Improve truck flow with ITS	0					
	Various	R.FR-23	Remote area for overnight freight parking and staging for early morning deliveries	?					
	Various	R.FR-26	Full depth shoulders for truck usage on key freeways and arterials)	0					
	Various	R.FR-27	Traveler Information System (TIS) on SR 167 for I-405 "options"	0					
	Various	R.FR-28	TIS on I-5 for SR 18/I-90; and 164th to I-405; and South 200th to I-405	0					
	Various	R.FR-29	Centralized fax/radio for real time congestion reporting for dispatchers and truck drivers. Leverage WSDOT video linkages (e.g., a "T-911" number).	0					
	Various	R.FR-30	Hours of operation and service periods optimized—"JIT" redefined for applicable service sectors (e.g. restaurants)	0					
	Various	R.FR-32	Light cargo delivery using Sound Transit service	0					
			Total =	0	0	0			0
22.	**Intelligent Transportation Systems (ITS)**								
	Various	ITS.1	Add Camera Coverage to decrease TMC blind spots	0					

	Various	ITS.2	Complete Ramp Metering	0					
	Various	ITS.4	Dual Lane Ramp Metering	0					
	Various	ITS.5	Increased Incident Response	0					
	Various	ITS.6	Traffic adaptive control on arterials	0					
	Various	ITS.7	TIS before all major decision points	0					
	Various	ITS.8	WSDOT support of in-vehicle traffic information	0					
	Various	ITS.9	Arterial camera coverage	0					
			Total =	0	0	0			0
4.	**High Capacity Transit**								
	Tuk. & Rent	T.HCT-1	HCT- SeaTac to Renton CBD	3	3	0.5	N	N	20.9
	Renton	T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)	0					8.5
	Ren< New	T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria	1	0	0.7	Y	Y	8.3
	Bell & Issa	T.HCT-4	HCT - Factoria To Issaquah	2	0	0.1	Y	Y	10.1
	Bellevue	T.HCT-5	HCT Factoria to Downtown Bellevue	6	3	0.1	N	Y	13.3
	Bell & Red	T.HCT-6	HCT - Bellevue to Redmond	7	4	0.5	N	Y	27.3
	Bell & Kirk	T.HCT-7	HCT- Bellevue to Totem Lake	5	1	0.1	N	Y	20.6
	Kirk & King	T.HCT-8	HCT - Totem Lake to Bothell	11	3	2.8	N	Y	17.0
	Various	T.HCT-9	HCT - Bothell to Lynnwood	10	3	0.6	N	Y	12.4
		T.HCT-10	Rail Maintenance and Storage	?					28.4
			Total =	45	17	5			167
4.	**High Capacity Transit Sta**		1 = yes, potential wetlands						
	Tukwila	HCT.TS-2	Southcenter	0					
	Tukwila & R	HCT.TS-3	Tukwila (Longacres)	1					
	Renton	HCT.TS-4	Downtown Renton	0					
	Renton	HCT.TS-5	North Renton	0					
	Renton	HCT.TS-6	Port Quendall	1					
	Bellevue	HCT.TS-7	Factoria	0					
	Bellevue	HCT.TS-8	Bellevue Transit Center	0					
	Bellevue	HCT.TS-9	Bellevue Library	0					
	Bell & Kirk	HCT.TS-10	SR 520/Northup Way	1					
	Kirkland	HCT.TS-11	Downtown Kirkland (NE 85th Street)	0					
	Kirkland	HCT.TS-12	Totem Lake	1					
	Woodinville	HCT.TS-13	NE 145th Street	1					
	Woodinville	HCT.TS-14	Woodinville	1					
	Bothell	HCT.TS-15	NE 195th	1					
	Bothell	HCT.TS-16	Canyon Park	1					
	Sno County	HCT.TS-17	164th Street AW (AshWay)	?					
	Bellevue	HCT.TS-18	Eastgate	0					
	King County	HCT.TS-19	Lakemont	0					
	Bellevue	HCT.TS-21	132nd Avenue NE	1					
	Bellevue	HCT.TS-22	148th Avenue NE	0					
	Redmond	HCT.TS-23	Overlake (NE 40th Street)	0					
	Redmond	HCT.TS-24	Redmond Town Center	0					
	Redmond	HCT.TS-25	Bear Creek	1					
	Mercer Islar	HCT.TS-26	Mercer Island	0					
			Total =	?	0	0			0
3.	**Transit Service (TS)**								
		TS 2	Twice the service in the proposed 6-year plans for Sound Transit, METRO and Community Transit	0					9.3
			Total =	0	0	0			9.3
8.	**Park and Rides (PR)**		1=potential wetland impacts						
	K C	T.PR-8	SR 169 and 140th Place SE	0					5.0
	K C	T.PR-9	Petrovitsky Rd and 157th Ave SE	0					5.0
	K C	T.PR-10	140th Ave SE and SE 192nd	0					5.0
	K C	T.PR-11	SR 515 and SE 208th	0					5.0
	Kent & Ren	T.PR-12	SR 167 and SW 43rd	1					5.0
	Kent & Ren	T.PR-13	SR 167 and 84th Ave	1					5.0

	Redmond	T.PR-17	Willows Rd @ NE 100th	1					5.0
	Redmond	T.PR-18	SR 202 @ NE 100th	1					5.0
	KC	T.PR-26	SR 202 @ NE 145th	1					5.0
			Total =	?	0	0			45
1.	**TDM (TDM)**								
	Various	TDM 1	TDM Package	0					
		TDM 2	Expanded TDM Package- Regional Congestion Pricing	0					
			Total =	0	0	0			0
21.	**I-405 Crossings**								
	Bellevue	NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks	0					0.1
	Bothell	NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility	1	0	0.1	N	-	1.9
	King County	NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder	2	0	0.75	N	-	1.9
	Sno. County	NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder	2	1	0.4	N	-	2.8
	Renton	NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder	0					1.4
	Renton	NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder	0					0.8
	Bothell	NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike overcrossing of I-405	2	2	1.2	N	-	1.2
	Bothell	NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility	3	1	0.2	N	-	1.4
			Total =	10	4	3			12
21.	**Pedestrian/Bicycle Connections**								
	Bellevue,Ki	NM.P&B-2	BNSF Right of Way - SE 8th to Totem Lake - Add ped/bike facility.	0					12.6
	Bellevue	NM.P&B-4	Lk Washington Blvd - SR 405 to SE 60th - Add ped/bike facilities	0					1.1
	Bothell	NM.P&B-5	North Creek Trail Link - 240th to 232nd - Add ped/bike trail.	1	1	0.6	N	Y	0.6
	Bel,Nwcas,I	NM.P&B-6	Lk Washington Blvd/112th - SE 60th to May Creek I/C - Add ped/bike facility	0					1.0
	Renton	NM.P&B-14	Cedar River Trail S. Extension - I-405 to Burnett Ave - Add ped/bike facilities	0					0.1
	Renton	NM.P&B-15	Cedar River Trail/Lake Washington Blvd Connector - Cedar River Trail to Lk Wash Blvd Loop - Add ped/bike facilities	0					1.1
	Renton	NM.P&B-16	Cedar-Duwamish Trail Connection - I-405 to Interurban Ave. S. - Add ped/bike facilities	2	1	0.2	-	Y	0.7
	Renton	NM.P&B-17	I-405/SR-167 trail connection - Lind Ave. SE to Talbot Rd S. - Add trail connection	1	0	0.1	Y	Y	1.1
	Renton/Tuk	NM.P&B-18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities	0					0.7
	Tukwila	NM.P&B-19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes	0					1.9
			Total =	4	2	1			21
			Alternative Total=	**81**	**34**	**13.3**			**328**

Alternative 2 - "Mixed Mode w/Transit Emphasis"										
Element#	Agency	ID	Project	Number of WLs Impacted	Number of Cat. 1 WLs impacted	Total Acreage of Fill	Avoidance within ROW possible?	Avoidance with another alignment possible?	New Impervious Surface
10.	**Basic I-405 Improvement Projects**								
	Renton	R.BI.1 & R.FR-10	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167	2	1	0.1	N	N	2.8
	Kirkland	R.BI.2	Continue NB climbing Lane from NE 70th to NE 85th and continue as auxiliary Lane to NE 116th	0					4.0
	Kirkland	R.BI.3	SB auxiliary Lane NE 124th to NE 85th	0					2.1
	Bellevue	R.BI.4	I-90 / Coal Creek Interchange	0					10.7
	Both,King C	R.BI.5	SB SR 522 to 124th continue climbing lane as an auxiliary lane	1	0	0.3	N	-	4.0
	Bothell	R.BI.6	NB auxiliary lane Sr 522 to SR 527	0					4.8
	Renton	R.BI.7	Kennydale Hill climbing lane - SR 900 to 44th - NB 900 to 30th, SB 44th - 30th	0					3.4
	Bellevue	R.BI.8	I-90 to Bellevue SB HOV direct connection to I-90 west	0					1.0
	Bellevue	R.BI.9	NB auxiliary lane I-90 to NE 8th	1	0	0.1	N	N	3.2
	Bellevue	R.BI.10	Increase SR 405 to Eastbound SR 520 Ramp capacity	0					8.0
	Renton	R.BI.14	NB Auxilliary Lane I-5 to SR 167	2	1	0.1	N	-	5.1
	Various	R.FR-24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)	NA					
			Total =	6	2	1			49
14.	**Widen SR 167 by 1 lane each direction to study Area boundary**								
	Renton, Ker	R.CF.8	SR 167 I-405 to Study Area Boundary	27	5	12	N	-	20.5
			Total =	27	5	12			20
16.	**Connecting Freeway Capacity (Matched to fit I-405 Improvements)**								
	Tuikwila	R.CF.1	SR 518 I-405 to SR 99/Airport Access	0					6.1
	Bothell, Wo	R.CF.5	SR 522 Bothell to NE 195th	2	1	0.5	N	-	8.0
	Sno Co, Lyn	R.CF.6	SR 525 I-405 to SR 99	1	1	0.1	Y	-	9.6
	Tukwila	R.CF.9	I-5 at Tukwila	0					5.3
	Lynnwood	R.CF.10	I-5 at Swamp Creek - 44th to 155th	?					6.4
			Total =	3	2	1			35
10A.	**One additional GP or Auxiliary lane in each direction**								
	Tukwila,Ren	R.TC-9	One additional GP lanes in each direction - SR 5 Tukwila to SR 167	2	1	0.3	N	N	10.2
	Renton	R.TC-10	One additional GP lanes in each direction - SR 167 to SR 900/North Renton I/C	1	1	0.1	N	N	7.0
	Ren, Nwcas	R.TC-11	One additional GP lanes in each direction - SR 900/North Renton I/C to SR 90	5	0	0.1	N	N	17.9
	Bellevue	R.TC-12	One additional GP lanes in each direction - SR 90 To SR 520	2	0	0.1	N	N	12.2
	Bellevue,Kir	R.TC-13	One additional GP lanes in each direction - SR 520 to NE 70th (Varify need for additional through capacity on this section)	1	0	0.5	N		9.3
	Kirkland	R.TC-14	One additional GP lanes in each direction - NE 70th to NE 124th	1	0	0.1	Y	-	8.3
	Kirk,K C,Bo	R.TC-15	One additional GP lanes in each direction - NE 124th SR 522	8	2	0.4	Y	-	10.9
	Bothell,Sno	R.TC-16	One additional GP lanes in each direction - SR 522 to SR 527	29	3	8	N	-	9.6
	Sno. Co	R.TC-17	One additional GP lanes in each direction - SR 527 to SR 5 Swamp Creek	13	3	3.5	N	-	11.5
			Total =	62	10	13			97
19.	**Arterial Interchange Improvements (Matched to fit I-405 Improvements)**								
	Tukwila	R.IC-3 & R.AC-36	SR 181 West Valley Highway/ Interurban	0					0.0
	Kirkland, Re	R.IC-8	NE 85th St-Kirkland Way to 124th	0					1.8
	Kirkland	R.IC-9	NE 116th- 114th Ave NE to 124th Ave NE	0					1.9
	Kirkland	R.IC-10	NE 124th- 113th Ave NE to 124th Ave NE	0					1.8
	Bothell	R.IC-11	SR 527-228th to SR 524	7	3	1	N	-	2.4
			Total =	7	3	1			8
7.	**HOV Interchange Ramps (Direct Access)**								
	Tukwila	R.HOV-25	SR 5 I/C @ Tukwila Fwy to Fwy HOV ramps,	0					19.4
	Renton	R.HOV-26	SR 167 I/C Fwy to Fwy HOV ramps,	0					12.9
	Bellevue	R.HOV-27	SR 90 I/C Fwy to Fwy HOV ramps,	0					19.4
	Bellevue	R.HOV-28	SR 520 Fwy to Fwy HOV ramps,	0					25.0
	Bothell	R.HOV-29	SR 522 Fwy to Fwy HOV Ramps	8	2	4	N	Y	12.9

	Sno. Co.	R.HOV-30	SR 5 I/C @ Swamp Creek Fwy HOV ramps.	8	3	3	Y	N	12.9
	Newcastle	R.HOV-65	112th St SE (In-Line Station)	0					0.6
			Total =	16	5	7			103
6.	**Arterial HOV**								
	Bellevue	R.HOV-36	Coal Creek Pkwy from I-405 to Forest Drive	0					0.2
	Bellevue	R.HOV-37	NE 8th Street from I-405 to 120th Ave NE	0					0.5
	Kirk, Redmo	R.HOV-38	NE 85th St from Kirkland Way to 148th Ave NE Vicinity	4	1	0.3	N	N	2.3
	Kirkland	R.HOV-39	NE 116th from 115th Ave NE to 124th Ave NE	0					1.0
	Kirkland	R.HOV-40	NE 124th from 113th Ave NE to 132 Ave NE	0					0.7
	Renton	R.HOV-43	SR 169 from SR 405 to Riverview Park Vicinity - HOV/Transit Preferential treatment.	0					1.4
	Renton	R.HOV-44	SW 27th St Corridor in Renton from Oaksdale Ave to SR 167	3	3	2	N	Y	6.7
	Redmond	R.HOV-47	Avondale Rd from Novelty Hill Rd to Avondale Way/ Construct SB HOV lane	0					1.5
	Renton, Kin	R.HOV-48	SW 43 St from SR 167 to 140 Ave SE	0					4.1
	Renton	R.HOV-49	Logan Ave N/N 6 St from S 3 St to Park Dr, Transit Signal Priority	0					0.0
	Renton	R.HOV-51	Park Dr/Sunset Blvd from Garden Ave to Duvall Ave NE, Que Bypass'	0					0.5
	Kenmore	R.HOV-53 & R.PA.11	68 Ave NE (Simonds Rd to SR 522) - Construct NB HOV lane	1	1	0.1	N	-	0.5
	Redmond	R.HOV-55	Willows Rd (Redmond Wy to NE 124 St)	0					0.7
	Kirkland, Be	R.HOV-56	Lake Washington Blvd (SR 520 to Yarrow Bay) - HOV lanes	1	1	0.3	N	-	1.3
	Kirkland	R.HOV-57	NE 68 St/NE 72 Pl (I-405 Vicinity) Que Bypass'	0					0.2
	Bellevue	R.HOV-60	Bellevue Way - I-90 to South Bellevue Park and Ride Vicinity	0					0.3
			Total =	9	6	3			22
23.	**Freight (F)**								
	Various	R.FR-11	Improve truck flow with ITS	0					
	Various	R.FR-23	Remote area for overnight freight parking and staging for early morning deliveries	?					
	Various	R.FR-26	Full depth shoulders for truck usage on key freeways and arterials)	NA					
	Various	R.FR-27	Traveler Information System (TIS) on SR 167 for I-405 "options"	0					
	Various	R.FR-28	TIS on I-5 for SR 18/I-90; and 164th to I-405; and South 200th to I-405	0					
	Various	R.FR-29	Centralized fax/radio for real time congestion reporting for dispatchers and truck drivers. Leverage WSDOT video linkages (e.g., a "T-911" number).	0					
	Various	R.FR-30	Hours of operation and service periods optimized—"JIT" redefined for applicable service sectors (e.g. restaurants)	0					
		R.FR-32	Light cargo delivery using Sound Transit service	0					
			Total =	0	0	0			0
22.	**Intelligent Transportation Systems (ITS)**								
	Various	ITS.1	Add Camera Coverage to decrease TMC blind spots	0					
	Various	ITS.2	Complete Ramp Metering	0					
	Various	ITS.4	Dual Lane Ramp Metering	0					
	Various	ITS.5	Increased Incident Response	0					
	Various	ITS.6	Traffic adaptive control on arterials	0					
	Various	ITS.7	TIS before all major decision points	0					
	Various	ITS.8	WSDOT support of in-vehicle traffic information	0					
	Various	ITS.9	Arterial camera coverage	0					
			Total =	0	0	0			0
4.	**High Capacity Transit**								
	Tuk. & Rent	T.HCT-1	HCT- SeaTac to Renton CBD	3	3	0.5	N	N	20.9
	Renton	T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)	0					8.5
	Ren< New	T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria	1	0	0.7	Y	Y	8.3
	Bell & Issa	T.HCT-4	HCT - Factoria To Issaquah	2	0	0.1	Y	Y	10.1
	Bellevue	T.HCT-5	HCT Factoria to Downtown Bellevue	6	3	0.1	N	Y	13.3
	Bell & Red	T.HCT-6	HCT - Bellevue to Redmond	7	4	0.5	N	Y	27.3
	Bell & Kirk	T.HCT-7	HCT- Bellevue to Totem Lake	5	1	0.1	N	Y	20.6
	Kirk & King	T.HCT-8	HCT - Totem Lake to Bothell	11	3	2.8	N	Y	17.0
	Various	T.HCT-9	HCT - Bothell to Lynnwood	10	3	0.6	N	Y	12.4
		T.HCT-10	Rail Maintenance and Storage	?					28.4
			Total =	45	17	5			167
4.	**High Capacity Transit Sta**		1 = yes, potential wetlands						

	Tukwila	HCT.TS-2	Southcenter	0					
	Tukwila & R	HCT.TS-3	Tukwila (Longacres)	1					
	Renton	HCT.TS-4	Downtown Renton	0					
	Renton	HCT.TS-5	North Renton	0					
	Renton	HCT.TS-6	Port Quendall	1					
	Bellevue	HCT.TS-7	Factoria	0					
	Bellevue	HCT.TS-8	Bellevue Transit Center	0					
	Bellevue	HCT.TS-9	Bellevue Library	0					
	Bell & Kirk	HCT.TS-10	SR 520/Northup Way	1					
	Kirkland	HCT.TS-11	Downtown Kirkland (NE 85th Street)	0					
	Kirkland	HCT.TS-12	Totem Lake	1					
	Woodinville	HCT.TS-13	NE 145th Street	1					
	Woodinville	HCT.TS-14	Woodinville	1					
	Bothell	HCT.TS-15	NE 195th	1					
	Bothell	HCT.TS-16	Canyon Park	1					
	Sno County	HCT.TS-17	164th Street AW (AshWay)	?					
	Bellevue	HCT.TS-18	Eastgate	0					
	King County	HCT.TS-19	Lakemont	0					
	Bellevue	HCT.TS-21	132nd Avenue NE	1					
	Bellevue	HCT.TS-22	148th Avenue NE	0					
	Redmond	HCT.TS-23	Overlake (NE 40th Street)	0					
	Redmond	HCT.TS-24	Redmond Town Center	0					
	Redmond	HCT.TS-25	Bear Creek	1					
	Mercer Islar	HCT.TS-26	Mercer Island	0					
			Total =	?	0	0			0
3.	**Transit Service (TS)**								
	Various	TS 2	Twice the service in the proposed 6-year plans for Sound Transit, METRO and Community Transit						9.0
			Total =	0	0	0			9
8.	**Park and Rides (PR)**								
	K C	T.PR-8	SR 169 and 140th Place SE	0					5.0
	K C	T.PR-9	Petrovitsky Rd and 157th Ave SE	0					5.0
	K C	T.PR-10	140th Ave SE and SE 192nd	0					5.0
	K C	T.PR-11	SR 515 and SE 208th	0					5.0
	Kent & Ren	T.PR-12	SR 167 and SW 43rd	?					5.0
	Kent & Ren	T.PR-13	SR 167 and 84th Ave	?					5.0
	Redmond	T.PR-17	Willows Rd @ NE 100th	?					5.0
	Redmond	T.PR-18	SR 202 @ NE 100th	?					5.0
	KC	T.PR-26	SR 202 @ NE 145th	?					5.0
			Total =	0	0	0			45
1.	**TDM (TDM)**								
	Various	TDM 1	TDM Package	0					
			Total =	0	0	0			0
21.	**I-405 Crossings**								
	Bellevue	NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks	0					0.1
	Bothell	NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility	1	0	0.1	N	-	1.9
	King County	NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder	2	0	0.75	N	-	1.9
	Sno. County	NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder	2	1	0.4	N	-	2.8
	Renton	NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder	0					1.4
	Renton	NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder	0					0.8
	Bothell	NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike overcrossing of I-405	2	2	1.2	N	-	1.2
	Bothell	NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility	3	1	0.2	N	-	1.4
			Total =	10	4	3			12
21.	**Pedestrian/Bicycle Connections**								
	Bellevue,Ki	NM.P&B-2	BNSF Right of Way - SE 8th to Totem Lake - Add ped/bike facility.						12.6
	Bellevue	NM.P&B-4	Lk Washington Blvd - SR 405 to SE 60th - Add ped/bike facilities	0					1.1

	Bothell	NM.P&B-5	North Creek Trail Link - 240th to 232nd - Add ped/bike trail.	1	1	0.6	N	Y	0.6
	Bel,Nwcas,I	NM.P&B-6	Lk Washington Blvd/112th - SE 60th to May Creek I/C - Add ped/bike facility	0					1.0
	Renton	NM.P&B-14	Cedar River Trail S. Extension - I-405 to Burnett Ave - Add ped/bike facilities	0					0.1
	Renton	NM.P&B-15	Cedar River Trail/Lake Washington Blvd Connector - Cedar River Trail to Lk Wash Blvd Loop - Add ped/bike facilities	0					1.1
	Renton	NM.P&B-16	Cedar-Duwamish Trail Connection - I-405 to Interurban Ave. S. - Add ped/bike facilities	2	1	0.2	-	Y	0.7
	Renton	NM.P&B-17	I-405/SR-167 trail connection - Lind Ave. SE to Talbot Rd S. - Add trail connection	1	0	0.1	Y	Y	1.1
	Renton/Tuk	NM.P&B-18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities	0					0.7
	Tukwila	NM.P&B-19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes	0					1.9
			Total =	4	2	1			21
17.	**Planned Arterial Projects**								
	Bellevue	R.PA-2	148 Ave SE (SE 24 St to SE 28 St) New SB lane from SE 24 St to the WB I-90 on-ramp (ETP 203)	0					0.7
	Bothell	R.PA-3	SR 522 Multimodal Corridor Project--- Widen SR-522 mostly within existing ROW to provide transit lanes, safety improvements, consolidated driveways & left turn lanes; and sidewalks. (ETP R-107)	1	0	0.1	Y	-	1.1
	Bothell	R.PA-4	SR 524 (SR 527 to Bothell City Limit)--- Widen to 5 lanes + CGS, bike facilities (class III) (ETP R-11)	2	2	2.6	N	-	8.9
	KCDOT	R.PA-5	SE 212 Way/SE 208 St (SR 167 to Benson Rd/SR 515)--- Widen to 6 lanes + bike facilities, Transit/HOV preferential treatment, turn channels. (ETP R-46)	1	0	0.1	Y	-	4.4
	KCDOT	R.PA-8	NE 124/128 St (SR 202 to Avondale Rd)--- Widen to 4/5 lanes including bike & equestrian facilities (ETP 164)	2	2	0.6	N	-	7.9
	KCDOT	R.PA-10	NE 132 St Extension (132 Ave NE to Willows Rd Ext.)---- Construct new 3 lane arterial with CGS, bike lanes (ETP 61)	0					2.1
	Kirkland	R.PA-12	124 Ave NE (NE 85 St to Slater Rd NE)--- Widen to 3 lanes (s. of NE 116th St, 5 lanes n. of NE 116th St with ped/bike facilities (ETP R-23)	2	2	0.6	N	-	1.1
	Kirkland	R.PA-13 & R.IC-26	NE 132 St (100 Ave NE to 116 Way NE)--- Widen to 3 lanes + CGS, Bike lane (ETP R-124)	1	0	0.1	N		0.0
	Kirkland	R.PA-14	NE 100 St (117 Ave NE to Slater Ave) --- Construct bike/pedestrian/emergency Vehicle overpass across I-405 (ETP 309)	0					0.3
	Newcastle	R.PA-15	Coal Creek Pkwy (SE 72 St to Renton City Limits)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signals (ETP R-24)	0					5.1
	Redmond	R.PA-16	Redmond 148th Ave NE Corridor - 3 projects--- Turn lane and channelization improvements along corridor – BROTS;	0					0.7
	Redmond	R.PA-17	Bear Creek Pkwy--- Construct new 162nd Ave NE arterial and new 72nd St arterial w/ bike/ped and CSG; widen Bear Creek Pkwy (ETP R-110)	2	1	0.4	N	-	4.2
	Redmond	R.PA-18	Union Hill Rd (Avondale Rd to 196 Ave NE)--- Widen to 4/5 lanes with bike facilities (ETP R-27)	2	2	0.1	N		6.1
	Renton	R.PA-19	Duvall Ave NE (NE 4 St to NE 25 Court -City Limits)--- Widen to 5 lanes + CGS, bikeway (ETP R-31)	0					4.2
	Renton	R.PA-20	Oakesdale Ave SW (Monster Rd to SR 900) Replace Monster Rd Bridge; widen to 4/5 lanes +Bike Lanes + CGS (ETP R-35)	3	2	0.2	N	-	3.2
	Renton	R.PA-21	Rainier Ave/Grady Way (Intersection)--Grade separation	0					0.5
	Renton	R.PA-22	SW Grady Way (SR 167 to SR 515)--- Rechannelize and modify signals for a continuous eastbound lane (ETP R-37)	0					0.0
	Renton	R.PA-23	SR 167 at East Valley Road--- New southbound off-ramp and signalization at East Valley Road (ETP 255)	0					0.6
	Renton/ KC	R.PA-24	Soos Creek Regional Links--- Placeholder for Trans-Valley Study (ETP R-115)	0					0.0
	Woodinville	R.PA-25 & R.AC.30	SR 522 Interchange Package(SR 522/SR 202 &SR522/195th St)--- Access improvements and new freeway ramps (ETP R-53) (See R.AC-30)	4	2	0.75	Y	Y	0.0
	Woodinville	R.PA-26	SR202 Corridor Package (SR202/148th Ave & SR202/127th Place)--- Intersection improvements (ETP R-54)	0					0.7
	WSDOT	R.PA-27	SR 520/SR 202 Interchange --- Complete interchange by constructing a new ramp and thru lane on 202 to SR 520 (ETP R-29)	0					7.8
	WSDOT	R.PA-28 & R.AC-17	SR 202 / 140 Place NE (NE 124 St to NE 175 St)--- Widen 4/5 lanes (ETP R-43) (See R.AC-17, 18)	1	1	0.2	N	-	17.5
			Total =	21	14	6			77
			Alternative Total=	**210**	**70**	**51.7**			**665**

Alternative 3 - "Mixed Mode"									
Element#	Agency	ID	Project						
10.	**Basic I-405 Improvement Projects**			Number of WLs Impacted	Number of Cat. 1 WLs impacted	Total Acreage of Fill	Avoidance within ROW possible?	Avoidance with another alignment possible?	New Impervious Surface
	Renton	R.BI.1 & R.FR-10	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167	2	1	0.1	N	N	2.8
	Bellevue	R.BI.4	I-90 / Coal Creek Interchange	0					10.7
	Various	R.FR-24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)	NA					
			Total =	2	1	0			13
11.	**Two additional GP lanes in each direction**								
	Tukwila,Ren	R.TC-1	Two additional GP lanes in each direction - SR 5 Tukwila to SR 167	2	1	0.5	N	N	20.5
	Renton	R.TC-2	Two additional GP lanes in each direction - SR 167 to SR 900/North Renton I/C	1	1	0.1	N	N	14.1
	Renton, Nw	R.TC-3	Two additional GP lanes in each direction - SR 900/North Renton I/C to SR 90	5	0	0.2	N	N	35.8
	Bellevue	R.TC-4	Two additional GP lanes in each direction - SR 90 To SR 520	2	0	0.2	N	N	24.3
	Bellevue,Kir	R.TC-5	Two additional GP lanes in each direction - SR 520 to NE 70th	1	0	1	N	Y	18.6
	Kirkland	R.TC-6	Two additional GP lanes in each direction - NE 70th to NE 124th	1	0	0.1	Y	-	16.6
	Kirk,K C,Bo	R.TC-7	Two additional GP lanes in each direction - NE 124th SR 522	8	2	0.8	N	Y	21.8
	Bothell,Sno	R.TC-8	Two additional GP lanes in each direction - SR 522 to SR 527	29	3	17	N	Y	19.2
	Bothell,Sno	R.TC-9	Two additional GP lanes in each direction - SR 527 to SR 5	13	3	7	N	N	23.0
			Total =	62	10	27			194
14.	**Widen SR 167 by 1 lane each direction to study Area boundary**								
	Renton, Ken	R.CF.8	SR 167 I-405 to Study Area Boundary	27	5	12	N	-	20.5
			Total =	27	5	12			20
16.	**Connecting Freeway Capacity (Matched to fit I-405 Improvements)**								
	Tuikwila	R.CF.1	SR 518 I-405 to SR 99/Airport Access	0					6.1
	Bellevue	R.CF.3	I-90 South Bellevue to Eastgate	0					11.2
	Bothell, Wo	R.CF.5	SR 522 Bothell to NE 195th	2	1	0.5	N	-	8.0
	Sno Co, Lyn	R.CF.6	SR 525 I-405 to SR 99	1	1	0.1	Y	-	9.6
	Tukwila	R.CF.9	I-5 at Tukwila	0					5.3
	Lynnwood	R.CF.10	I-5 at Swamp Creek - 44th to 155th	4	3	2			6.4
			Total =	7	5	3			47
18.	**Arterial Capacity (AC) Actions**								
	King Co, Re	R.AC-3	138th Ave SE - Construct roadway link to 4/5 lanes- SR 169 to NE 4th St	1	1	0.3	N	-	11.1
	King Co,Wo	R.AC-16	Willows Rd- NE 124th St to NE 145th St- construct new facility -4/5 lanes	0					14.4
			Total =	1	1	0			26
19.	**Arterial Interchange Improvements (Matched to fit I-405 Improvements)**								
	Tukwila	R.IC-3 & R.AC-36	SR 181 West Valley Highway/ Interurban	0					0.0
	Kirkland, Re	R.IC-8	NE 85th St-Kirkland Way to 124th	0					1.8
	Kirkland	R.IC-9	NE 116th- 114th Ave NE to 124th Ave NE	0					1.9
	Kirkland	R.IC-10	NE 124th- 113th Ave NE to 124th Ave NE	0					1.8
	Bothell	R.IC-11	SR 527-228th to SR 524	7	3	1	N	-	2.4
	Kirk,King C	R.IC-14	New half diamond interchange to/from north at NE 132nd St	0					1.8
	Bothell	R.IC-21	New SR 405 Interchange at 240th Street SE(Bothell)	2	0	0.1	Y	-	4.4
			Total =	9	3	1			14
7.	**Committed HOV Projects**								
	ST	HOV-101	I-405 @ Lind/HOV direct access improvements.	0					5
	Kirkland	R.HOV-61	NE 85th	0					4
				0	0	0	0	0	8

7.	**HOV Interchange Ramps (Direct Access)**								
	Tukwila	R.HOV-25	SR 5 I/C @ Tukwila Fwy to Fwy HOV ramps,	0					19.4
	Renton	R.HOV-26	SR 167 I/C Fwy to Fwy HOV ramps,	0					12.9
	Bellevue	R.HOV-27	SR 90 I/C Fwy to Fwy HOV ramps,	0					19.4
	Bellevue	R.HOV-28	SR 520 Fwy to Fwy HOV ramps,	0					25.0
	Bothell	R.HOV-29	SR 522 Fwy to Fwy HOV Ramps	8	2	4	N	Y	12.9
	Sno. Co.	R.HOV-30	SR 5 I/C @ Swamp Creek Fwy HOV ramps.	8	3	3	Y	N	12.9
			Total =	16	5	7			103
6.	**Arterial HOV**								
	Bellevue	R.HOV-36	Coal Creek Pkwy from I-405 to Forest Drive	0					0.2
	Bellevue	R.HOV-37	NE 8th Street from I-405 to 120th Ave NE	0					0.5
	Kirk, Redmo	R.HOV-38	NE 85th St from Kirkland Way to 148th Ave NE Vicinity	4	1	0.3	N	N	2.3
	Kirkland	R.HOV-39	NE 116th from 115th Ave NE to 124th Ave NE	0					1.0
	Kirkland	R.HOV-40	NE 124th from 113th Ave NE to 132 Ave NE	0					0.7
	Renton	R.HOV-43	SR 169 from SR 405 to Riverview Park Vicinity - HOV/Transit Preferential treatment.	0					1.4
	Renton	R.HOV-44	SW 27th St Corridor in Renton from Oaksdale Ave to SR 167	3	3	2	N	Y	6.7
	Redmond	R.HOV-47	Avondale Rd from Novelty Hill Rd to Avondale Way/ Construct SB HOV lane	0					1.5
	Renton, Kin	R.HOV-48	SW 43 St from SR 167 to 140 Ave SE	0					4.1
	Renton	R.HOV-49	Logan Ave N/N 6 St from S 3 St to Park Dr, Transit Signal Priority	0					0.0
	Renton	R.HOV-51	Park Dr/Sunset Blvd from Garden Ave to Duvall Ave NE, Que Bypass'	0					0.5
	Kenmore	R.HOV-53 & R.PA.11	68 Ave NE (Simonds Rd to SR 522) - Construct NB HOV lane	1	1	0.1	N	-	0.5
	Redmond	R.HOV-55	Willows Rd (Redmond Wy to NE 124 St)	0					0.7
	Kirkland, Be	R.HOV-56	Lake Washington Blvd (SR 520 to Yarrow Bay) - HOV lanes	1	1	0.3	N	-	1.3
	Kirkland	R.HOV-57	NE 68 St/NE 72 Pl (I-405 Vicinity) Que Bypass'	0					0.2
	Bellevue	R.HOV-60	Bellevue Way - I-90 to South Bellevue Park and Ride Vicinity	0					0.3
			Total =	9	6	3			22
23.	**Freight (F)**								
	Various	R.FR-11	Improve truck flow with ITS	0					
	Various	R.FR-23	Remote area for overnight freight parking and staging for early morning deliveries	?					
	Various	R.FR-26	Full depth shoulders for truck usage on key freeways and arterials)	NA					
	Various	R.FR-27	Traveler Information System (TIS) on SR 167 for I-405 “options”	0					
	Various	R.FR-28	TIS on I-5 for SR 18/I-90; and 164th to I-405; and South 200th to I-405	0					
	Various	R.FR-29	Centralized fax/radio for real time congestion reporting for dispatchers and truck drivers. Leverage WSDOT video linkages (e.g., a “T-911” number).	0					
	Various	R.FR-30	Hours of operation and service periods optimized—“JIT” redefined for applicable service sectors (e.g. restaurants)	0					
	Various	R.FR-32	Light cargo delivery using Sound Transit service	0					
			Total =	0	0	0			0
22.	**Intelligent Transportation Systems (ITS)**								
	Various	ITS.1	Add Camera Coverage to decrease TMC blind spots	0					
	Various	ITS.2	Complete Ramp Metering	0					
	Various	ITS.4	Dual Lane Ramp Metering	0					
	Various	ITS.5	Increased Incident Response	0					
	Various	ITS.6	Traffic adaptive control on arterials	0					
	Various	ITS.7	TIS before all major decision points	0					
	Various	ITS.8	WSDOT support of in-vehicle traffic information	0					
	Various	ITS.9	Arterial camera coverage	0					
			Total =	0	0	0			0
4.	**High Capacity Transit**								
	Tuk. & Rent	T.HCT-1	HCT- SeaTac to Renton CBD	**NOT THE SAME AS THE PARSONS BRINKERHOFF**					

	Renton	T.HCT-2	HCT-Renton CBD to NE 44th (Port Quendall)	**PLANS AND SECTIONS**					
	Ren< New	T.HCT-3	HCT- NE 44th (Port Quendall) to Factoria	**USES EXISTING ROADWAYS**					
	Bell & Issa	T.HCT-4	HCT - Factoria To Issaquah						
	Bellevue	T.HCT-5	HCT Factoria to Downtown Bellevue						
	Bell & Red	T.HCT-6	HCT - Bellevue to Redmond						
	Bell & Kirk	T.HCT-7	HCT- Bellevue to Totem Lake						
	Kirk & King	T.HCT-8	HCT - Totem Lake to Bothell						
	Various	T.HCT-9	HCT - Bothell to Lynnwood						
			Total =	0	0	0			0
4.	**High Capacity Transit Stations**								
	Tukwila	HCT.TS-2	Southcenter	**NOT THE SAME AS THE PARSONS BRINKERHOFF**					
	Renton	HCT.TS-4	Downtown Renton	**PLANS AND SECTIONS**					
	Renton	HCT.TS-6	Port Quendall	**USES EXISTING ROADWAYS**					
	Bellevue	HCT.TS-7	Factoria						
	Bellevue	HCT.TS-8	Bellevue Transit Center						
	Bell & Kirk	HCT.TS-10	SR 520/Northup Way						
	Kirkland	HCT.TS-11	Downtown Kirkland (NE 85th Street)						
	Kirkland	HCT.TS-12	Totem Lake						
	Bothell	HCT.TS-15	NE 195th						
	Bothell	HCT.TS-16	Canyon Park						
	Sno County	HCT.TS-17	164th Street AW (AshWay)						
	Bellevue	HCT.TS-18	Eastgate						
	Redmond	HCT.TS-23	Overlake (NE 40th Street)						
	Redmond	HCT.TS-24	Redmond Town Center						
	Mercer Islar	HCT.TS-26	Mercer Island						
			Total =	0	0	0			0
3.	**Transit Service (TS)**								
	Various	TS 2	Twice the service in the proposed 6-year plans for Sound Transit, METRO and Community Transit	0					23.9
			Total =	0	0	0			23.9
8.	**Park and Rides (PR)**		1=potential wetlands						
	K C	T.PR-8	SR 169 and 140th Place SE	0					5.0
	K C	T.PR-9	Petrovitsky Rd and 157th Ave SE	0					5.0
	K C	T.PR-10	140th Ave SE and SE 192nd	0					5.0
	K C	T.PR-11	SR 515 and SE 208th	0					5.0
	Kent & Ren	T.PR-12	SR 167 and SW 43rd	1					5.0
	Kent & Ren	T.PR-13	SR 167 and 84th Ave	1					5.0
	Redmond	T.PR-17	Willows Rd @ NE 100th	1					5.0
	Redmond	T.PR-18	SR 202 @ NE 100th	1					5.0
	KC	T.PR-26	SR 202 @ NE 145th	1					5.0
			Total =	?	0	0			45
1.	**TDM (TDM)**								
	Various	TDM 1	TDM Package	0					
			Total =	0	0	0			0
21.	**I-405 Crossings**								
	Bellevue	NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks	0					0.1
	Bothell	NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility	1	0	0.1	N	-	1.9
	King County	NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder	2	0	0.75	N	-	1.9

	Sno. County	NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder	2	1	0.4	N	-	2.8
	Renton	NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder	0					1.4
	Renton	NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder	0					0.8
	Bothell	NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike overcrossing of I-405	2	2	1.2	N	-	1.2
	Bothell	NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility	3	1	0.2	N	-	1.4
			Total =	10	4	3			12
21.	**Pedestrian/Bicycle Connections**								
	Bellevue,Kir	NM.P&B-2	BNSF Right of Way - SE 8th to Totem Lake - Add ped/bike facility.	0					12.6
	Bellevue	NM.P&B-4	Lk Washington Blvd - SR 405 to SE 60th - Add ped/bike facilities	0					1.1
	Bothell	NM.P&B-5	North Creek Trail Link - 240th to 232nd - Add ped/bike trail.	1	1	0.6	N	Y	0.6
	Bel,Nwcas,I	NM.P&B-6	Lk Washington Blvd/112th - SE 60th to May Creek I/C - Add ped/bike facility	0					1.0
	Renton	NM.P&B-14	Cedar River Trail S. Extension - I-405 to Burnett Ave - Add ped/bike facilities	0					0.1
	Renton	NM.P&B-15	Cedar River Trail/Lake Washington Blvd Connector - Cedar River Trail to Lk Wash Blvd Loop - Add ped/bike facilities	0					1.1
	Renton	NM.P&B-16	Cedar-Duwamish Trail Connection - I-405 to Interurban Ave. S. - Add ped/bike facilities	2	1	0.2	-	Y	0.7
	Renton	NM.P&B-17	I-405/SR-167 trail connection - Lind Ave. SE to Talbot Rd S. - Add trail connection	1	0	0.1	Y	Y	1.1
	Renton/Tuk	NM.P&B-18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities	0					0.7
	Tukwila	NM.P&B-19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes	0					1.9
			Total =	4	2	1			21
17.	**Planned Arterial Projects**								
	Bellevue	R.PA-2	148 Ave SE (SE 24 St to SE 28 St) New SB lane from SE 24 St to the WB I-90 on-ramp (ETP 203)	0					0.7
	Bothell	R.PA-3	SR 522 Multimodal Corridor Project--- Widen SR-522 mostly within existing ROW to provide transit lanes, safety improvements, consolidated driveways & left turn lanes; and sidewalks. (ETP R-107)	1	0	0.1	Y	-	1.1
	Bothell	R.PA-4	SR 524 (SR 527 to Bothell City Limit)--- Widen to 5 lanes + CGS, bike facilities (class III) (ETP R-11)	2	2	2.6	N	-	8.9
	KCDOT	R.PA-5	SE 212 Way/SE 208 St (SR 167 to Benson Rd/SR 515)--- Widen to 6 lanes + bike facilities, Transit/HOV preferential treatment, turn channels. (ETP R-46)	1	0	0.1	Y	-	4.4
	KCDOT	R.PA-8	NE 124/128 St (SR 202 to Avondale Rd)--- Widen to 4/5 lanes including bike & equestrian facilities (ETP 164)	2	2	0.6	N	-	7.9
	KCDOT	R.PA-10	NE 132 St Extension (132 Ave NE to Willows Rd Ext.)---- Construct new 3 lane arterial with CGS, bike lanes (ETP 61)	0					2.1
	Kirkland	R.PA-12	124 Ave NE (NE 85 St to Slater Rd NE)--- Widen to 3 lanes (s. of NE 116th St, 5 lanes n. of NE 116th St with ped/bike facilities (ETP R-23)	2	2	0.6	N	-	1.1
	Kirkland	R.PA-13 & R.IC-26	NE 132 St (100 Ave NE to 116 Way NE)--- Widen to 3 lanes + CGS, Bike lane (ETP R-124)	1	0	0.1	N	-	0.0
	Kirkland	R.PA-14	NE 100 St (117 Ave NE to Slater Ave) --- Construct bike/pedestrian/emergency Vehicle overpass across I-405 (ETP 309)	0					0.3
	Newcastle	R.PA-15	Coal Creek Pkwy (SE 72 St to Renton City Limits)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signals (ETP R-24)	0					5.1
	Redmond	R.PA-16	Redmond 148th Ave NE Corridor - 3 projects--- Turn lane and channelization improvements along corridor – BROTS;	0					0.7
	Redmond	R.PA-17	Bear Creek Pkwy--- Construct new 162nd Ave NE arterial and new 72nd St arterial w/ bike/ped and CSG; widen Bear Creek Pkwy (ETP R-110)	2	1	0.4	N	-	4.2

	Redmond	R.PA-18	Union Hill Rd (Avondale Rd to 196 Ave NE)--- Widen to 4/5 lanes with bike facilities (ETP R-27)	2	2	0.1	N		6.1
	Renton	R.PA-19	Duvall Ave NE (NE 4 St to NE 25 Court -City Limits)--- Widen to 5 lanes + CGS, bikeway (ETP R-31)	0					4.2
	Renton	R.PA-20	Oakesdale Ave SW (Monster Rd to SR 900) Replace Monster Rd Bridge; widen to 4/5 lanes +Bike Lanes + CGS (ETP R-35)	3	2	0.2	N	-	3.2
	Renton	R.PA-21	Rainier Ave/Grady Way (intersection)--Grade separation	0					0.5
	Renton	R.PA-22	SW Grady Way (SR 167 to SR 515)--- Rechannelize and modify signals for a continuous eastbound lane (ETP R-37)	0					0.0
	Renton	R.PA-23	SR 167 at East Valley Road--- New southbound off-ramp and signalization at East Valley Road (ETP 255)	0					0.6
	Renton/ KC	R.PA-24	Soos Creek Regional Links--- Placeholder for Trans-Valley Study (ETP R-115)	0					0.0
	Woodinville	R.PA-25 & R.AC.30	SR 522 Interchange Package(SR 522/SR 202 &SR522/195th St)--- Access improvements and new freeway ramps (ETP R-53) (See R.AC-30)	4	2	0.75	Y	Y	0.0
	Woodinville	R.PA-26	SR202 Corridor Package (SR202/148th Ave & SR202/127th Place)--- Intersection improvements (ETP R-54)	0					0.7
	WSDOT	R.PA-27	SR 520/SR 202 Interchange --- Complete interchange by constructing a new ramp and thru lane on 202 to SR 520 (ETP R-29)	0					7.8
	WSDOT	R.PA-28 & R.AC-17	SR 202 / 140 Place NE (NE 124 St to NE 175 St)--- Widen 4/5 lanes (ETP R-43) (See R.AC-17, 18)	1	1	0.2	N	-	17.5
			Total =	21	14	6			77
			Alternative Total=	**168**	**56**	**62**			**625**

Alternative 4 - "General Capacity"										
Element#	Agency	ID	Project							
10.	**Basic I-405 Improvement Projects**			Number of WLs Impacted	Number of Cat. 1 WLs impacted	Total Acreage of Fill	Avoidance within ROW possible?	Avoidance with another alignment possible?	New Impervious Surface	
	Renton	R.BI.1 & R.FR-10	SR 167 Interchange - Direct Connection with auxiliary lane SB SR 169 to SR 167	2	1	0.1	N	N	2.8	
	Kirkland	R.BI.2	Continue NB climbing Lane from NE 70th to NE 85th and continue as auxiliary Lane to NE 116th	0					4.0	
	Kirkland	R.BI.3	SB auxiliary Lane NE 124th to NE 85th	0					2.1	
	Bellevue	R.BI.4	I-90 / Coal Creek Interchange	0					10.7	
	Both,King C	R.BI.5	SB SR 522 to 124th continue climbing lane as an auxiliary lane	1	0	0.3	N	-	4.0	
	Bothell	R.BI.6	NB auxiliary lane Sr 522 to SR 527	0					4.8	
	Renton	R.BI.7	Kennydale Hill climbing lane - SR 900 to 44th - NB 900 to 30th, SB 44th - 30th	0					3.4	
	Bellevue	R.BI.8	I-90 to Bellevue SB HOV direct connection to I-90 west	0					1.0	
	Bellevue	R.BI.9	NB auxiliary lane I-90 to NE 8th	1	0	0.1	N	N	3.2	
	Bellevue	R.BI.10	Increase SR 405 to Eastbound SR 520 Ramp capacity	0					8.0	
	Renton	R.BI.14	NB Auxilliary Lane I-5 to SR 167	2	1	0.1	N	-	5.1	
	Various	R.FR-24	Improve interchange geometrics at all major truck routes (WB-20 Design Criteria)	NA						
			Total =	6	2	1			49	
13.	**Express Lanes- 2 lanes each direction between major interchanges**									
	Tukwila,Ren	R.TC-20 + R.TC-29a	Add Express lanes - SR 5 Tukwila to SR 167	2	1	0.5	N	N	35.8	
	Renton	R.TC-21	Add Express lanes - SR 167 to SR 900 North Renton	1	1	0.1	N	N	24.6	
	Ren, Nwcas	R.TC-22 + R.TC-33	Add Express lanes -SR 900 North Renton I/C to SR 90	5	0	0.2	N	N	62.7	
	Bellevue	R.TC-23	Add Express lanes - SR 90 to SR 520	2	0	0.2	N	N	42.6	
	Bellevue,Ki	R.TC-24 + R.TC-32	Add Express lanes - SR 520 to NE 70th	1	0	1	N	Y	32.5	
	Kirkland	R.TC-25	Add Express lanes - NE 70th to NE 124th	1	0	0.1	Y	-	29.1	
	Kirk,K C,Bo	R.TC-26 + R.TC-31	Add Express lanes - NE 124th to SR 522	8	2	0.8	N	Y	38.1	
	Bothell,Sno	R.TC-27	Add Express lanes - SR 522 to SR 527	29	3	17	N	Y	33.6	
	Renton	R.TC-28	Add Express lanes- on SR 167 north of 180th up to I-405	3	0	10	N	Y	40.3	
	Sno. Co.	R.TC-29 + R.TC-30	Add Express lanes- on SR 527 to SR 5 Swamp Creek	13	3	7	N	N	10.6	
			Total =	65	10	37			350	
13.	**Express Lanes - Access Locations**									
	Renton	R.TC-34	Interchange access location- SR 167	1	0	0.7	N	N	4.0	
			Total =	1	0	1			4	
14.	**Widen SR 167 by 1 lane each direction to study Area boundary**									
	Renton, Ken	R.CF.8	SR 167 I-405 to Study Area Boundary	27	5	12	N	-	20.5	
			Total =	27	5	12			20	
16.	**Connecting Freeway Capacity (Matched to fit I-405 Improvements)**									
	Tuikwila	R.CF.1	SR 518 I-405 to SR 99/Airport Access	0					6.1	
	Bellevue	R.CF.3	I-90 South Bellevue to Eastgate	0					11.2	
	Bellevue	R.CF.4	SR 520 Bellevue Way to 148th	1	0	0.1	N	N	13.1	
	Bothell, Wo	R.CF.5	SR 522 Bothell to NE 195th	2	1	0.5	N	-	8.0	
	Sno Co, Lyn	R.CF.6	SR 525 I-405 to SR 99	1	1	0.1	Y	-	9.6	
	Tukwila	R.CF.9	I-5 at Tukwila	0					5.3	
	Lynnwood	R.CF.10	I-5 at Swamp Creek - 44th to 155th						6.4	
			Total =	4	2	1			60	
10A.	**One additional GP or Auxiliary lane in each direction**									
	Tukwila,Ren	R.TC-9	One additional GP lanes in each direction - SR 5 Tukwila to SR 167	2	1	0.3	N	N	10.2	
	Renton	R.TC-10	One additional GP lanes in each direction - SR 167 to SR 900/North Renton I/C	1	1	0.1	N	N	7.0	
	Ren, Nwcas	R.TC-11	One additional GP lanes in each direction - SR 900/North Renton I/C to SR 90	5	0	0.1	N	N	17.9	

	Bellevue	R.TC-12	One additional GP lanes in each direction - SR 90 To SR 520	2	0	0.1	N	N	12.2
	Bellevue,Ki	R.TC-13	One additional GP lanes in each direction - SR 520 to NE 70th (Verify need for additional through capacity on this section)	1	0	0.5			9.3
	Kirkland	R.TC-14	One additional GP lanes in each direction - NE 70th to NE 124th	1	0	0.1	Y	-	8.3
	Kirk,K C,Bo	R.TC-15	One additional GP lanes in each direction - NE 124th SR 522	8	2	0.4	Y	-	10.9
	Bothell,Sno	R.TC-16	One additional GP lanes in each direction - SR 522 to SR 527	29	3	8	N	-	9.6
	Bothell,Sno	R.TC-17	One additional GP lanes in each direction - SR 527 to SR 5 Swamp Creek	13	3	3.5	N	-	11.5
			Total =	62	10	13			97
18.	**Arterial Capacity (AC) Actions**								
	King Co, Re	R.AC-3	138th Ave SE - Construct roadway link to 4/5 lanes- SR 169 to NE 4th St	1	1	0.3	N	-	11.1
	Redmond	R.AC-15 & R-111	Willows Rd- NE 90th St to NE 124th St- Add 1 lane each direction	6	3	2	N		5.3
	King Co,Wo	R.AC-16	Willows Rd- NE 124th St to NE 145th St- construct new facility -4/5 lanes	0					14.4
	Both,S C,M	R.AC-20	SR 527/Bothell Everett Hwy - SR 522 to SR 524 - Widen by 1 lane each direction	4	2	0.8	Y		3.9
	Tukwila	R.AC-35	SR 181- S 180th to S 200th	1	1	0.8	Y		2.6
	Tukwila	R.AC-37	Southcenter Pky - Tukwila Pky to Strander Blvd	0					1.9
			Total =	12	7	4			39
19.	**Arterial Interchange Improvements (Matched to fit I-405 Improvements)**								
	Tukwila	R.IC-3 & R.AC-36	SR 181 West Valley Highway/ Interurban	0					0.0
	Renton	R.IC-4	SR 169 Maple Valley Hwy SR 900 to NE 5th	0					0.0
	Kirkland, Re	R.IC-8	NE 85th St-Kirkland Way to 124th	0					1.8
	Kirkland	R.IC-9	NE 116th- 114th Ave NE to 124th Ave NE	0					1.9
	Kirkland	R.IC-10	NE 124th- 113th Ave NE to 124th Ave NE	0					1.8
	Bothell	R.IC-11	SR 527-228th to SR 524	7	3	1	N	-	2.4
	Kirk,King C	R.IC-14	New half diamond interchange to/from north at NE 132nd St	0					1.8
	Bothell	R.IC-21	New SR 405 Interchange at 240th Street SE(Bothell)	2	0	0.1	Y	-	4.4
			Total =	9	3	1.1	0	0	14.1
7.	**HOV Interchange Ramps (Direct Access)**								
	Tukwila	R.HOV-25	SR 5 I/C @ Tukwila Fwy to Fwy HOV ramps,	0					19.4
	Renton	R.HOV-26	SR 167 I/C Fwy to Fwy HOV ramps,	0					12.9
	Bellevue	R.HOV-27	SR 90 I/C Fwy to Fwy HOV ramps,	0					19.4
	Bellevue	R.HOV-28	SR 520 Fwy to Fwy HOV ramps,	0					25.0
	Bothell	R.HOV-29	SR 522 Fwy to Fwy HOV Ramps	8	2	4	N	Y	12.9
	Sno. Co.	R.HOV-30	SR 5 I/C @ Swamp Creek Fwy HOV ramps.	8	3	3	Y	N	12.9
			Total =	16	5	7			103
22.	**Intelligent Transportation Systems (ITS)**								
	Various	ITS.1	Add Camera Coverage to decrease TMC blind spots	0					
	Various	ITS.2	Complete Ramp Metering	0					
	Various	ITS.4	Dual Lane Ramp Metering	0					
	Various	ITS.5	Increased Incident Response	0					
	Various	ITS.6	Traffic adaptive control on arterials	0					
	Various	ITS.7	TIS before all major decision points	0					
	Various	ITS.8	WSDOT support of in-vehicle traffic information	0					
	Various	ITS.9	Arterial camera coverage	0					
			Total =	0	0	0			0
New Transit Service (TS)									
	Various	TS 1	Fifty percent more service assumed in the current 6-year plans for Sound Transit, METRO and Community Transit	NA					9.8
			Total =	0	0	0			10
1.	**TDM (TDM)**								
	Various	TDM 1	TDM Package	0					
			Total =	0	0	0			0
21.	**I-405 Crossings**								
	Bellevue	NM. CR-1	Lk Washington Blvd/112th Ave. SE - crossing I-405 from 106th Ave. SE to 112th Place SE - Add sidewalks	0					0.1
	Bothell	NM. CR-2	Fitzgerald Rd/27th Ave. - crossing I-405 from 228th St. SE to 240th St. SE - Add ped/bike facility	1	0	0.1	N	-	1.9
	King County	NM. CR-3	SR-524 (Filbert Road) - crossing I-405 from North Rd to Locust Way - Add sidewalk/paved shoulder	2	0	0.75	N	-	1.9

	Sno. County	NM. CR-4	Damson Road - crossing I-405 from 192nd St SW to Logan Rd - Add sidewalk/paved shoulder	2	1	0.4	N	-	2.8
	Renton	NM. CR-5	NE Park Drive - crossing I-405 from SR-900/Sunset Blvd to Lake Wash Blvd - Add sidewalk/paved shoulder	0					1.4
	Renton	NM. CR-6	Jackson SW/Longacres Dr SW - crossing I-405 from S. Longacres Way to Monster Rd SW - Add sidewalk/paved shoulder	0					0.8
	Bothell	NM. CR-7	Connection between Sammamish River Trail and North Creek Trail - between SR-522 and NE 195th St. - Add ped/bike overcrossing of I-405	2	2	1.2	N	-	1.2
	Bothell	NM. CR-8	SR-527 - crossing I-405 from 220th St SE to 228th St SE - ped/bike facility	3	1	0.2	N	-	1.4
			Total =	10	4	3			12
21.	**Pedestrian/Bicycle Connections**								
	Renton/Tuk	NM.P&B-18	I-405/1-5 - via or around I-405/I-5 interchange - Add ped/bike facilities	0					0.7
	Tukwila	NM.P&B-19	SR-181/W. Valley Hwy - crossing I-405 from Strander Blvd to Fort Dent Way - Add bike lanes	0					1.9
			Total =	0	0	0			3
17.	**Planned Arterial Projects**								
	Bellevue	R.PA-2	148 Ave SE (SE 24 St to SE 28 St) New SB lane from SE 24 St to the WB I-90 on-ramp (ETP 203)	0					0.7
	Bothell	R.PA-3	SR 522 Multimodal Corridor Project--- Widen SR-522 mostly within existing ROW to provide transit lanes, safety improvements, consolidated driveways & left turn lanes; and sidewalks. (ETP R-107)	1	0	0.1	Y	-	1.1
	Bothell	R.PA-4	SR 524 (SR 527 to Bothell City Limit)--- Widen to 5 lanes + CGS, bike facilities (class III) (ETP R-11)	2	2	2.6	N	-	8.9
	KCDOT	R.PA-5	SE 212 Way/SE 208 St (SR 167 to Benson Rd/SR 515)--- Widen to 6 lanes + bike facilities, Transit/HOV preferential treatment, turn channels. (ETP R-46)	1	0	0.1	Y	-	4.4
	KCDOT	R.PA-8	NE 124/128 St (SR 202 to Avondale Rd)--- Widen to 4/5 lanes including bike & equestrian facilities (ETP 164)	2	2	0.6	N	-	7.9
	KCDOT	R.PA-10	NE 132 St Extension (132 Ave NE to Willows Rd Ext.)---- Construct new 3 lane arterial with CGS, bike lanes (ETP 61)	0					2.1
	Kenmore/K	R.PA-11 & R.HOV.53	68 Ave NE (Simonds Rd to SR 522)--- Construct NB HOV lane total of 5/6 lanes (ETP 22)	0					0.0
	Kirkland	R.PA-12	124 Ave NE (NE 85 St to Slater Rd NE)--- Widen to 3 lanes (s. of NE 116th St, 5 lanes n. of NE 116th St with ped/bike facilities (ETP R-23)	2	2	0.6	N	-	1.1
	Kirkland	R.PA-13 & R.IC-26	NE 132 St (100 Ave NE to 116 Way NE)--- Widen to 3 lanes + CGS, Bike lane (ETP R-124)	1	0	0.1	Y	-	0.0
	Kirkland	R.PA-14	NE 100 St (117 Ave NE to Slater Ave) --- Construct bike/pedestrian/emergency Vehicle overpass across I-405 (ETP 309)	0					0.3
	Newcastle	R.PA-15	Coal Creek Pkwy (SE 72 St to Renton City Limits)--- Widen to 4/5 lanes + CGS, bike lanes, traffic signals (ETP R-24)	0					5.1
	Redmond	R.PA-16	Redmond 148th Ave NE Corridor - 3 projects--- Turn lane and channelization improvements along corridor – BROTS;	0					0.7
	Redmond	R.PA-17	Bear Creek Pkwy--- Construct new 162nd Ave NE arterial and new 72nd St arterial w/ bike/ped and CSG; widen Bear Creek Pkwy (ETP R-110)	2	1	0.4	N	-	4.2
	Redmond	R.PA-18	Union Hill Rd (Avondale Rd to 196 Ave NE)--- Widen to 4/5 lanes with bike facilities (ETP R-27)	2	2	0.1	N		6.1
	Renton	R.PA-19	Duvall Ave NE (NE 4 St to NE 25 Court -City Limits)--- Widen to 5 lanes + CGS, bikeway (ETP R-31)	0					4.2
	Renton	R.PA-20	Oakesdale Ave SW (Monster Rd to SR 900) Replace Monster Rd Bridge; widen to 4/5 lanes +Bike Lanes + CGS (ETP R-35)	3	2	0.2	N	-	3.2
	Renton	R.PA-21	Rainier Ave/Grady Way (intersection)--Grade separation	0					0.5
	Renton	R.PA-22	SW Grady Way (SR 167 to SR 515)--- Rechannelize and modify signals for a continuous eastbound lane (ETP R-37)	0					0.0
	Renton	R.PA-23	SR 167 at East Valley Road--- New southbound off-ramp and signalization at East Valley Road (ETP 255)						0.6
	Renton/ KC	R.PA-24	Soos Creek Regional Links--- Placeholder for Trans-Valley Study (ETP R-115)	0					0.0
	Woodinville	R.PA-25 & R.AC.30	SR 522 Interchange Package(SR 522/SR 202 &SR522/195th St)--- Access improvements and new freeway ramps (ETP R-53) (See R.AC-30)	4	2	0.75	Y	Y	0.0
	Woodinville	R.PA-26	SR202 Corridor Package (SR202/148th Ave & SR202/127th Place)--- Intersection improvements (ETP R-54)	0					0.7
	WSDOT	R.PA-27	SR 520/SR 202 Interchange --- Complete interchange by constructing a new ramp and thru lane on 202 to SR 520 (ETP R-29)	0					7.8
	WSDOT	R.PA-28 & R.AC-17	SR 202 / 140 Place NE (NE 124 St to NE 175 St)--- Widen 4/5 lanes (ETP R-43) (See R.AC-17, 18)	1	1	0.2	N	-	17.5
			Total =	21	14	6			77
			Alternative Total=	**233**	**62**	**84.4**			**837**

Grand Totals						
			WLs Impacted	Cat. 1 WLs impacted	Acreage	Impervious
No action		Alternative Total=	57	19	12	280
	HCT	Alternative Total=	81	34	13	328
Mixed w/ Transit		Alternative Total=	210	70	52	665
Mixed Mode		Alternative Total=	168	56	62	625
General Capacity		Alternative Total=	233	62	84	837

APPENDIX E

Background Information for Cumulative Effects

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1.0 CUMULATIVE EFFECTS

The Council on Environmental Quality's regulations implementing NEPA define cumulative effects as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR Section 1508.7). For the I-405 Corridor Program, the actions being evaluated are the proposed programmatic transportation improvements throughout the I-405 corridor in combination with past, present, and future land use development and other relevant non-project actions primarily within the four-county central Puget Sound region comprised of King, Kitsap, Pierce, and Snohomish counties.

1.1 Scope of Cumulative Effects Analysis

Scoping for the cumulative effects analyses was conducted to identify: (1) important cumulative effects issues; (2) critical resources that should be evaluated for potential cumulative effects; (3) geographic (spatial) boundaries for evaluating potential effects; (4) temporal (time frame) boundaries for each analysis; and (5) relevant past, present, and future actions that could affect the resources, ecosystems, and human communities of concern. This scoping ensured that the analyses were focused on those effects that were truly meaningful, and is consistent with guidelines that recommend cumulative effects analyses "count what counts."

Scoping for the cumulative effects analyses relied on information gained throughout the I-405 Corridor Program EIS process. The scope of the analyses was based on public and agency input requested during formal scoping meetings early in the EIS process; informal input received from the public and agencies as a result of public meetings; responses to I-405 Corridor Program newsletters and questionnaires; feedback from the Steering, Citizens, and Executive committees; and the results of prior research and technical analyses of direct and secondary effects conducted as part of the I-405 Corridor Program Draft EIS discipline studies.

1.1.1 Critical Resources

Geographic critical resources scoped for detailed evaluation of cumulative effects included: air quality; energy; surface water; wetlands; fish and aquatic habitat; and farmlands. These were scoped based on their heightened importance within the central Puget Sound region and/or I-405 corridor and their potential for substantial cumulative effects related to proposed I-405 Corridor Program improvements in combination with other foreseeable actions. Several reviewing agencies questioned whether energy and farmlands rose to the level that they should be scoped for analysis of potential cumulative effects. After further consideration it was agreed that analysis of these two elements would be included.

1.1.2 Geographic Boundaries

Geographic boundaries for evaluating potential cumulative effects were identified for each critical resource based on a number of factors. First, a geographic boundary for each resource analysis was identified by expanding the area of analysis to the point at which all potentially significant cumulative effects would be captured, and beyond which the resource would not be substantially affected. For analyses of natural environment elements such as fish and aquatic

habitat, the most meaningful natural boundary (in this case, the affected watershed[s]) was then identified and used as the geographic boundary for analyses. This does not mean that substantial cumulative effects were necessarily found to occur within these geographic units. Where natural boundaries were not meaningful, such as for energy, a different analytical boundary was selected that would be meaningful. The regulatory interests of agencies with jurisdiction also influenced some analytical boundaries, such as for air quality.

1.1.3 Temporal Boundaries

Similar to the geographic boundaries for evaluating potential cumulative effects, temporal boundaries also were identified for each resource analysis depending on the accumulation characteristics of the effects being assessed and the regulatory interests of agencies with jurisdiction. For most analyses of critical resources, year 2030 was selected as the future temporal boundary because it is the horizon year for *Destination 2030*, the 2001 update of the Metropolitan Transportation Plan, and encompasses *VISION 2020*, the region's long-range growth management, economic development, and transportation strategy. As discussed below, implementation of *VISION 2020* and the planned land use development that would result are by far the most consequential reasonable foreseeable actions that overlap geographically and temporally with the I-405 Corridor Program alternatives.

The cumulative effects of the No Action Alternative, which assumes implementation of VISION 2020 and programmed and funded transportation improvements, were identified as the most meaningful baseline for comparing potential cumulative effects of the action alternatives on critical resources, ecosystems, and human communities of concern. Overall, the magnitude of effect attributable to the I-405 Corridor Program action alternatives relative to all other past, present, and future actions is expected to generally diminish as the future 2020 design year for the I-405 Corridor Program approaches.

1.1.4 Framework for Cumulative Effects Analyses

The 2001 update of the Metropolitan Transportation Plan (MTP), referred to as *Destination 2030*, includes many of the transit, freeway, and arterial improvements contained in the I-405 Corridor Program action alternatives. The environmental effects of these I-405 corridor improvements and all other proposed transportation investments in the region were reviewed at a programmatic level in the *Final EIS for Destination 2030, The Metropolitan Transportation Plan for the Central Puget Sound Region* (Puget Sound Regional Council, May 2001), which is incorporated here by reference. The potential cumulative effects of these improvements are re-evaluated here in slightly different combinations than in *Destination 2030* (as the I-405 Corridor Program action alternatives), and they are combined with some transportation improvements that were not included in *Destination 2030*. Nonetheless, the *Final EIS for Destination 2030* provides a useful point of reference for assessing the magnitude and significance of the I-405 Corridor Program alternatives.

The Puget Sound Regional Council (PSRC) 20-year projections of growth in households and employment within the central Puget Sound region provided a partial basis for evaluating the geographic distribution of potential cumulative effects on critical resources, ecosystems, and human communities. In order to accomplish this, the PSRC land use forecasting model (DRAM/EMPAL) was used because the study area is located within the four counties covered by

the PSRC. This is the same forecasting model used by the PSRC to develop and update the MTP. For the I-405 Corridor Program forecasts and analyses, the proposed transportation improvements contained within each alternative were entered into the DRAM/EMPAL model in the form of increased access and mobility. King County, Snohomish County, and the PSRC also were consulted in order to gain an understanding of issues related to model outputs.

1.2 Relationship to Metropolitan Transportation Plan and Other Regional Actions

1.2.1 Metropolitan Transportation Plan

Destination 2030 is the 2001 update of the 1995 Metropolitan Transportation Plan (MTP). *Destination 2030,* operating as the transportation element of VISION 2020, emphasizes an integrated multi-modal transportation system and describes the regionally significant modal components of that system. The MTP serves as a planning tool used to identify regional transportation problems and analyze and develop regional solutions, and it serves as a focus for required state and regional transportation system performance monitoring, particularly for the federally mandated congestion management system.

Destination 2030 supports a balanced multi-modal transportation system that provides options to users, but the plan recognizes that capacity enhancements are needed to improve mobility on the region's roadways. Under *Destination 2030* vehicle miles traveled (VMT) is expected to increase by 45 percent and population by 50 percent over the next 30 years. To address this growth, the plan calls for an aggressive program of transportation investments. With these investments, the growth in travel demand can be accommodated with relatively minor impacts on system performance, such as a 2 percent increase in congestion (PM peak) in 2030.

The Metropolitan Transportation System (MTS), which is the system component of *Destination 2030,* includes the following major elements:

Roadways. The roadway and high-occupancy vehicle (HOV) systems are integral components of the region's transportation system and will continue to be into the foreseeable future. Individual streets and roads do not function independently, but rather form a network through which traffic flows and connects to regional freeways. *Destination 2030* includes improvements on principal arterials and arterial HOV lanes, and adds general-purpose and HOV lane miles to the interstate and state route system in the four-county region.

Transit. The transit component is comprised of major regional transit services and facilities that provide public transportation access between major regional activities centers, connecting designated urban centers and major regional employment locations. Regional transit services can provide an alternate travel mode in congested corridors. In addition to the region's planned fixed-guideway HCT (light rail and commuter rail) and passenger-only ferry service, transit services are also represented by the transportation facilities they use – general-purpose lanes, HOV lanes, and exclusive transit rights-of-way. Regional transit facilities include major park-and-ride lots, transit centers, and ferry terminals.

Non-Motorized Transportation System. This component of the MTS includes pedestrian improvement zones located in designated urban centers and regional transit station areas including bus, rail, and ferry facilities.

1.2.2 I-405 Corridor Program Improvements Contained in Destination 2030

All of the core projects and strategies in the four action alternatives developed for the I-405 Corridor Program are included in *Destination 2030*. These transportation improvement projects and strategies are in response to the planned growth under the existing jurisdictional comprehensive plans, which in turn conform to the regional planned growth under *VISION 2020*. *Destination 2030* includes the I-405 study arterial, transit, and freeway improvements, and includes two general-purpose lanes in each direction on I-405. These additional lanes are included in Alternative 3.

The I-405 Corridor Program alternatives do not include all the HCT facilities that are included in *Destination 2030.* Links completing the HCT network around the region, such as north to Everett by 2030, are not included. Alternatives 1 and 2 do include the following fixed-guideway HCT routes and stations: Seattle to Issaquah across Mercer Island/I-90; SeaTac to Totem Lake in the I-405 corridor; and Bellevue to Redmond. In addition, the MTP uses HOV 2+, while the I-405 Corridor Program study uses HOV 3+ in the alternatives. Analysis showed that the HOV use along I-405 does not vary much among the study alternatives since the number of HOV lanes remains constant across alternatives. HOV 3+ use ranges from 3 to 4 percent of vehicles in the north end, and up to 10 percent in the south end of the corridor.

Appendix B identifies the projects within each alternative for the I-405 Corridor Program. The lists of projects included in the *Destination 2030* are found in Appendix 9 – Project List and the Supplemental Destination 2030 Project List of *Destination 2030*.

In addition, reasonably foreseeable federal, non-federal, and private actions identified during scoping that could be cumulative with the I-405 Corridor Program action alternatives are already addressed within the *Final EIS for Destination 2030* (May 2001). The most notable among these are the following, which are discussed in greater detail below:

- Trans-Lake Washington Project
- I-90 HOV transit improvements and lane additions between I-5 and I-405
- Sound Transit Phase II
- VISION 2020 proposed long-term regional land use plan

1.2.3 Trans-Lake Washington Project

WSDOT and Sound Transit have moved into the environmental analysis, documentation, and review phase of the Trans-Lake project to study options for crossing Lake Washington north of I-90, including the SR 520 bridge. In this phase, the recommendations from the study committee, as well as alternatives suggested by other community members, agencies, and advocacy groups, will be evaluated to determine the recommendations' value in improving mobility, their impacts on the environment and affected communities, and the steps that may need to be taken to avoid or mitigate negative impacts or to add positive impacts. An EIS will be prepared as part of the review process. The environmental analysis, documentation, and review process is expected to conclude in 2003. HCT across Lake Washington north of I-90 is not included in the I-405 Corridor Program or *Destination 2030*; the HCT is on the I-90 facility from the I-405 Interchange to downtown Seattle in Alternatives 1 and 2.

1.2.4 I-90 Transit Improvements and Lane Additions

HCT is assumed to operate along I-90 from Seattle to Issaquah by 2020 in Alternatives 1 and 2, and in *Destination 2030*. A Sound Transit study is currently looking at ways to improve transit on the I-90 bridge. It is not clear at this point if I-90 will convert the reversible express lanes to two-way transit operation, or whether they will remain as reversible lanes.

1.2.5 Sound Transit Phase II

Since 1996, Sound Transit has been implementing Sound Move, the first phase of the voter approved regional transit long-range vision that includes regional bus service, HOV access improvements, park-and-ride lots, and commuter rail and light rail. Except for commuter and light rail facilities, a variety of these regional HCT investments are being implemented along the I-405 corridor. At the present time all of the Sound Move commitments programmed for the I-405 corridor should be completed by 2006, the original completion year for Phase I. All Sound Move commitments are included in *Destination 2030* and the I-405 Corridor Program alternatives.

The Sound Transit Board is now considering substantial changes to routes and segment phasing for LINK light rail in Seattle, which would extend the first phase Sound Move implementation period for that element alone out to approximately 2009. Sound Transit has targeted 2004 as the probable year for a Phase II public vote on a new set of proposed regional HCT investments to be implemented between 2006 and 2016 or 2020. Assuming a positive vote outcome, the plan would provide additional (but as yet unspecified) HCT facilities and services to east King County, including jurisdictions within the I-405 corridor.

In the I-405 Corridor Program Alternatives 1 and 2, HCT was assumed to operate as a center-to-center fixed-guideway system utilizing BNSF and I-405 right-of-way along the length of I-405, with extensions to Redmond via SR 520 and to Issaquah via I-90 corridor alignments. Alternative 3 assumes that the high-capacity transit element would take the form of an advanced bus rapid transit system, primarily using HOV lanes, operating on I-405, SR 520, and I-90.

1.2.6 VISION 2020

Destination 2030 functions as the transportation element of *VISION 2020*. *VISION 2020* describes a regional land use pattern consistent with and supportive of the state's GMA policies (Growth Management Act). *Destination 2030* provides the regional transportation system to support the planned growth. The local comprehensive plans for cities in the study area were developed within the framework of *VISION 2020*. The alternatives for the I-405 study are consistent with all local jurisdictions' adopted land use zoning. The I-405 Corridor Program action alternatives are consistent with GMA in that they support implementation of the envisioned regional land use pattern.

1.3 Land Use, Development, and Transportation in the Region and Study Area

1.3.1 Regulatory Trends

Through the late 1980s and 1990s, new regulatory policies at the state, regional, and local levels were enacted that defined the boundaries within which growth would be accommodated and the amount of density that each city will need to accommodate over a 20-year horizon.

Washington State Growth Management Act

With little statewide or regional direction on growth, and the continued growth pattern, citizens' concerns triggered the adoption of the Washington State Growth Management Act (GMA) in 1990. The Act defined urban and rural growth areas (UGAs), designated urban centers (which came about through VISION 2020 and Countywide Planning Policies), established density targets in those urban centers, and established minimum levels of services on statewide infrastructure. For further detail see Section 3.13 and the *I-405 Corridor Program Draft Land Use Plans and Policies Expertise Report* (DEA, 2001a).

VISION 2020

The Puget Sound Regional Council (PSRC) adopted the update of *VISION 2020* in 1995. VISION 2020 serves as a long-range growth management, economic, and transportation strategy. It establishes a multiple-center approach to development that promotes a jobs/housing balance and plans for needed transportation improvements, specifying that improvements should occur at the same time as employment growth to implement the infrastructure concurrency requirements of GMA. *VISION 2020* focuses growth into the Urban Growth Area (UGA) defined by each county. The Metropolitan Transportation Plan (MTP) was adopted in 1995 as the transportation element of VISION 2020.

Metropolitan Transportation Plan

As noted, the MTP was initially adopted in 1995. The MTP is a long-range plan to guide transportation investments in the central Puget Sound region. It includes specific provisions relevant to the I-405 corridor, including policies to support development of dense centers and a greater mix of land uses, connected by a network of transit and non-motorized modes of travel. Key components of the MTP include regional transportation pricing strategies, freeway and arterial HOV systems, facilities for pedestrians and bicycles, travel demand management, and establishment of high-capacity transit modes along congested corridors that connect urban centers. The Puget Sound Regional Council updated the 1995 MTP in a revised plan titled *Destination 2030* in May 2001. The basic building block of *Destination 2030* is *VISION 2020*, with the same emphasis on coordinated city, county, port, and transit agency plans, and adopted multi-county and countywide planning policies. Destination 2030 takes into account the different growth patterns in the region and calls for focused growth in the urban centers. It also acknowledges implementation of a light rail system in the 2010 horizon with subsequent phases. *Destination 2030* takes an important step in calling for reduction of congestion points and includes many of the I-405 corridor improvements within the 2010 and 2030 horizons. The plan takes the existing list of projects from *VISION 2020* and revises them based on PSRC modeling.

It also includes a 2001–2010 "action strategy," which calls for a regional phasing plan to determine which transportation projects should be built first for the best land use effect.

County-Wide Planning Policies

King County, Pierce County, and Snohomish County, working with the local cities, took the lead in developing and adopting County-Wide Planning Policies (CWPP), which integrated land use planning with transportation planning policies. Cities, including the Eastside cities within the I-405 study area, adopted the CWPP as one regional implementation tool of the GMA and VISION 2020 policies.

The CWPP establish the urban center concept, which is beginning to take form within the designated UGA. Some of the urban centers are in the I-405 corridor area and planned infrastructure improvements will affect their long-term viability.

All of the local jurisdictions in the I-405 Corridor Program study area have adopted comprehensive plans in accordance with requirements of GMA, the CWPP and the PSRC multi-county planning policies. These comprehensive plans include a transportation element that has been reviewed and certified by the PSRC as conforming to the transportation planning elements of the GMA, VISION 2020, and the MTP. There are 80 adopted comprehensive plans in the Puget Sound region, 74 of which have certified transportation elements. The concurrency requirements of transportation elements require that key infrastructures be built or planned for within a 6-year time frame of any proposed development. The I-405 Corridor Program alternatives are generally supportive of the applicable jurisdictional local transportation plans.

1.3.2 Historical Land Use Changes and Trends

The Puget Sound region has experienced tremendous growth in two large cycles**,** one in the 1960s and another in the 1980s and 1990s. The Puget Sound region is still growing in 2001, with annual growth rates projected at 1.1 to 2.0 percent out to 2030 (PSRC, 2001). Prior to the 1970s there was strong growth in the region with federal spending on aviation, expansion of military installations, import/export services, and related industrial goods. In the mid-1970s, the growth slowed and the Puget Sound region felt the "brakes" of the economy. In the mid-1980s, the region experienced a revival of the economy with the arrival of Microsoft and the "high-tech" industry, increased spending on military technology with Boeing, and an upturn in the national economy. While the growth rate was substantial in the 1960s, the current predominant Eastside land uses did not emerge until the 1980s when the area transitioned from rural/suburban, to suburban/urban with identifiable urban centers.

The Eastside (communities east of Lake Washington) began the Twentieth Century as a rural area. Development did not begin in earnest until after the completion of the first Lake Washington floating bridge across Mercer Island in 1940. The bridge dramatically decreased the time it took to travel between Seattle and the Eastside. During the next twenty years the previously rural Eastside was transformed into a major suburb of Seattle, with development focused in Bellevue and the other neighborhoods having easy access to U.S. 10 (now I-90). The second major phase in the contemporary development of the Eastside began when the second Lake Washington floating bridge was completed in 1963. The opening of SR 520 facilitated access and development in the 1970s and early 1980s of the northern and northeastern portions

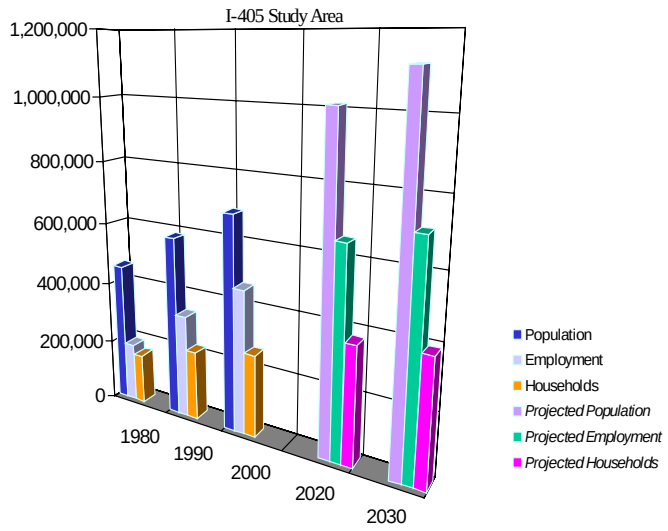
of the Eastside areas that had previously been difficult to access from Seattle. During the period the Eastside also became an important location for businesses and jobs, which increased 400 percent between 1960 and 1980.

The first businesses were retail, serving the needs of the residents, but from 1990 to 1997 the population increased by nearly 60,000 people and employment increased by 80,000 jobs as major international companies like Microsoft located on the Eastside and Boeing, the Eastside's biggest employer, expanded. Roadways were expanded and built in response to the employment and population growth. The land use plans and zoning currently approved for the Eastside anticipate considerable development over the next 30 years as well.

In the 1990s, towns that were once "bedroom" communities, such as Bellevue and Redmond, were transformed into major employment and commercial centers. The long-term regional growth trend has been toward population dispersion outward from Seattle and, late in the 1990s, from the Eastside cities eastward into agricultural and forested areas.

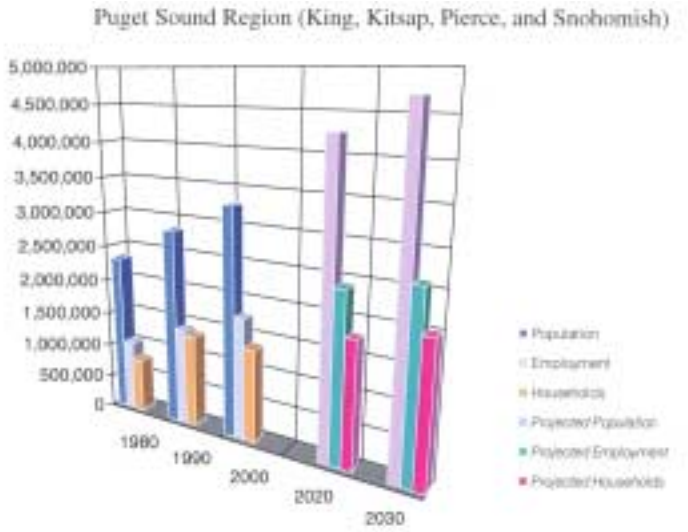
The I-405 corridor experienced the greatest growth between 1980 and 2000 as reflected in Figure 1.3-1. The growth that took place in employment and households was above the regional average.

Figure 1.3-1: Population, Employment, and Household Trends from 1980 to 2000 and Projections at 2020 and 2030



Between 2000 and 2030 the region is projected to add about 1.5 million people, 2 million new households, and 700,000 new jobs. The population in the region is expected to grow at an annual rate of 1.2 percent over the next 30 years, a substantial slowdown from the 2.0 percent pace of the 1960-00 period. By 2030, the population, as shown in Figure 1.3-2 is expected to reach 4.7 million, a 44 percent increase from the 2000 level.

Figure 1.3-2: Population, Employment, and Household Trends from 1980 to 2000 and Projections at 2020 and 2030



The trend of declining household size is expected to continue in the future, but at a more moderate pace. The updated forecasts project that, by 2030, there will be two million households in the region, a 50 percent increase above the 2000 total. The region's average household size is expected to be 2.3 people per household by the year 2030, down from the 2000 level of 2.5 persons per household (2001 MTP Baseline Technical Report – June 2000).

In the 1990s, aerospace was a major sector of the Puget Sound area's employment and economic base. In 1999, aerospace employment represented 40 percent of the total manufacturing sector jobs. Yet while aerospace was a substantial factor in the economy, the pre-packaged software industry accounted for 13 percent of the region's earnings in 1999. Recent forecasts indicate a shift in the regional economy to a new and growing sector – trade and service industries.

The forecast for 2030 economic performance will be tied to the growth in the trade and service industries. Projections suggest that trade and services will be the main growth sectors at an annual growth rate of about 1 percent or more between 2000 and 2030. The region is projected to have 1.5 million trade and service jobs, about 58 percent of all employment forecast through the year 2030 (2001 MTP Baseline Technical Report – June 2000).

1.3.3 Regional Land Use Trends and Growth

Summary of Population and Housing Trends in the Region

The Puget Sound region has experienced substantial growth in population during the past four decades. In the 1980s, the annual growth rate was approximately 2 percent with an estimated population of 2.7 million in 1990. The actual population ended up at more than 3 million in 1990, due to the in-migration drawn by a strong economy.

The substantial growth of in-migration of people took place between 1988 and 1989, when nearly 50,000 more people moved into this region than moved out. This exceeded the region's average of 20,000 for the previous 5 years. Population projections (Figure 1.3-2) indicate that by 2030, nearly 5 million people will be living within the region.

The housing trends are shown in Figure 1.3-2 from 1980 to 2030 for the region. Between 1995 and 1997 the number of residential units permitted increased regionally, with the number in King and Snohomish counties rising the fastest. Pierce and Kitsap counties experienced increases in permits from 1995 to 1996, but in 1997 fell 6 and 18 percent, respectively. Permits for single-family housing continued at a high level during the late 1990s and constituted the largest share of residential dwelling units.

The Growth Management Act (GMA), as discussed in regulatory trends, led to the establishment of the Urban Growth Area (UGA), a boundary for growth and designation of urban centers to absorb the growth. The UGA is likely to become denser as an additional million people populate the Puget Sound region by 2020. By the year 2030, a total of 1.7 million additional people are forecast to live in the region (Central Puget Sound Region - Growth Context Paper - PSRC Oct. 1999).

The UGA requires an effective transportation infrastructure, to provide access to the employment centers as well as the low-density suburban areas. The suburban areas are attractive due to lower land costs, but are often remote from employment opportunities. When housing is developed near employment centers, it may not be affordable to local employees, who then look further out – an ongoing development trend in east King County.

Summary of Employment in the Region

The Puget Sound region has experienced continued growth of both the manufacturing (aerospace and aviation) and service-oriented (software, computer technologies, and biotechnology) economic sectors. The I-405 corridor has a mix of both sectors, with aerospace manufacturing concentrated in the Kent and Renton areas and the software/high technology firms in Redmond, Bellevue, and the central and eastern areas. Both sectors generate high volumes of traffic on the freeway system.

Location analysis of selected industry clusters in the central Puget Sound region shows that certain industry groups tend to concentrate within particular parts of the region. Concentration of particular types of employment activity offer opportunities to examine transformations in the economic geography and travel behavior associated with different employment patterns, as discussed below (Central Puget Sound Region - Growth Context Paper - PSRC Oct. 1999).

In 1998, there were 190 aerospace firms in the region employing over 112,000 persons. The Boeing Company employs nearly 100,000 of these employees. Aerospace is concentrated, even after recent transfers among facilities, in south Seattle, Renton, Everett, and the Kent Valley. Non-Boeing aerospace employment (around 15,000 employees) tends to be located near the existing Boeing facilities.

Software firms employed nearly 30,000 persons in 1998. There were over 900 firms, 93 percent of which are small firms employing fewer than 50 employees. Half of all software employment is with Microsoft and 17 percent of the employment is with firms employing fewer than

50 employees. This has been an extremely high growth industry during the 1990s, with employment increasing by over 400 percent. These firms are primarily concentrated in downtown Seattle, Bellevue, Redmond, and to a lesser degree in other parts of east King County.

Biotechnology employment is concentrated primarily in downtown Seattle and around the University of Washington; some employment is located in the "high tech corridor" along I-405 in north King County and in Snohomish County. In 1998, biotechnology had an employment of 8,500 in 323 firms.

Temporary agency employment has seen high growth since 1990. Employment increased from 16,800 to 37,500. The size of temporary employment firms has increased much faster than the number of firms. These firms are highly concentrated and are primarily located in downtown Seattle and Bellevue.

These employment patterns and locations provide an insight into the many different pressures on the I-405 corridor to provide the means of movement of goods and people.

1.3.4 I-405 Study Area Land Use Trends and Growth

Summary of Population and Housing Trends in the I-405 Study Area

The I-405 area experienced substantial growth in the 1980s as shown in Figure 1.3-1. The projections for the I-405 study area in population growth, assuming an annual growth rate in the range of 1.4 to 2.0 percent, increase from 687,300 in 2000 to 1,010,500 in 2020 and 1,116,300 by 2030.

The household growth in the study area is expected to continue with a greater proportion living in multi-family units in the urban centers. Assuming an annual growth rate in the range of 0.5 percent to 1.2 percent, the households would increase from 265,200 in 2000 to 369,300 in 2020 and 390,500 by 2030. On a broader eastside view, PSRC forecasts indicate a growth rate in 2000 at 1.7 percent and dropping to 0.7 percent in 2030 for single-family households. The growth rate for multi-family units is forecast to range from 3.6 percent in 2000 to 0.7 percent in 2020, rising back up to 1.7 percent by 2030.

As discussed previously, the I-405 corridor has transitioned from a rural/suburban community into an urban area, focusing the continued growth into the urban centers of Bellevue, Redmond, Tukwila, Kirkland, and Renton. At the same time, the transportation infrastructure of I-405, SR 520, I-90, and the associated east/west major arterials are at capacity during peak hours.

The land use pattern in the I-405 corridor has followed the regional patterns, with focused employment centers and low-density suburban expansion outside of the downtown cores of Bellevue, Redmond, and Kirkland. Large residential subdivisions served by major arterials have experienced growth, with a parallel growth in the downtown cores of the eastside cities.

Summary of Employment in the I-405 Study Area

The I-405 study area, in comparison to the Puget Sound region (Figure 1.3-2), has grown at a greater pace in employment in the 1990s (Figure 1.3-1), and estimates project continued growth in the employment base. Projections, assuming an annual growth rate in the range of 0.8 to 1.5 percent, show employment rising from 462,300 in 2000 to 653,000 in 2020 and 708,400 by 2030.

The land use pattern on the Eastside is dependent upon the automobile. The potential for reducing single occupant vehicle trips and congestion is addressed in *Destination 2030* and the I-405 Corridor Program by continuing to develop HOV modes. Strategies include HOV priority lanes, high-capacity transit improvements (increased bus service and light rail), expanded commute trip reduction programs, and transportation demand management programs.

1.3.5 Results of DRAM/EMPAL Modeling for Region and Study Area

The PSRC land use forecasting model (DRAM/EMPAL) covers the four-county central Puget Sound region of Snohomish, King, Pierce, and Kitsap counties. This forecasting model is used by the PSRC to develop and update the MTP, including *Destination 2030*. State law requires the transportation elements of local comprehensive plans to be certified as consistent with the MTP. See the *I-405 Corridor Program Draft Land Use Expertise Report* (DEA, 2001b) for a more detailed discussion of the assumptions in the modeling process.

Based on the above trends, it was important in analyzing cumulative effects to view the population, employment, and households within the context of the regional plans, and therefore the PSRC model was utilized on small geographic areas known as forecast analysis zones (FAZ). The model projected employment and household growth within the FAZ geographical areas over the next 20 years. The projected growth of employment and households is based on the share of the state's population growth allocated to each county within the study area by the State Office of Financial Management (OFM) as required by the Growth Management Act (GMA). Each county and its cities are mandated by GMA to work collaboratively to plan for the coordinated accommodation of this projected growth in their respective comprehensive plans and ensuing implementation actions. Evaluating the I-405 Corridor Program alternatives necessitated adding the proposed transportation improvements (for example, miles of additional I-405 freeway general-purpose lanes) to the DRAM/EMPAL model in the form of increased access and mobility. In addition, King County, Snohomish County, and the PSRC were consulted in order to gain an understanding of issues related to projected growth and planned land use changes.

The results of the modeling were used to identify the cumulative effects, if any, on pressure for growth and development within the forecast analysis zones. Changes in mobility and accessibility within the study area could influence the locational preferences of individuals, businesses, and households. The sum of these individual preferences regarding where people live and work translate into changes in pressure for growth and assumed development activities, as regulated by local land use plans and zoning. These potential development activities are the cumulative effects from the I-405 Corridor Program combined with other regional corridor programs. When the action alternatives are compared to the No Action Alternative, there is a nominal range of decreases and increases in pressure for growth and development. This is assumed to be influenced by variations in the way each alternative enhances access to different portions of the I-405 corridor.

Destination 2030 includes many of the I-405 Corridor Program, SR 520, I-90, and SR 522 improvements. The cumulative effects of these transportation improvements on land use could be positive, with growth in population, employment, and households locating in the urban centers and in-fill development along the I-405 corridor.

The No Action Alternative does show a 24 percent increase in the projected growth from 2000 to 2020, but that is still within the range of projected growth for the region and the area, as defined by PSRC modeling. The No Action Alternative is an existing element within the PSRC model, as it includes existing and committed transportation projects.

The I-405 Corridor Program alternatives are compatible with existing regional and local land use plans, which already address growth.

It is important to remember that the No Action Alternative includes the committed projects that are likely to be built in the near future, and therefore are used for comparison purposes. The DRAM/EMPAL model forecasts the change of the No Action Alternative from 2000 to 2020, and the action alternatives are compared to the No Action Alternative at 2020.

No Action Alternative

The No Action Alternative could influence potential limited, localized effects in the form of increased pressure for growth in households outside of the Urban Growth Area. Figure 1.3-3 shows the future land use in the study area and Figures 1.3-4 and 1.3-5, based on the PSRC model, show the projected growth of employment and households that are forecast to take place by 2020 under the No Action Alternative. The No Action Alternative includes growth throughout the four-county region.

Table 1.3-1 lists areas of increase in employment and households in the central Puget Sound region. The employment growth within the study area is expected to occur along the I-405 corridor and throughout Seattle, the Sammamish Plateau, Kent Valley, Pierce County, North Bend, and Snoqualmie. Some household growth would occur outside of the UGA in south Snohomish County, east King County, northwest Pierce County, and Kitsap County.

Table 1.3-1: No Action Alternative Areas of Increase in Employment and Households

Regional Jurisdictions	Local Jurisdiction with Employment Growth over 3000 Employees in 2020	Local Jurisdiction with Household Growth over 3000 units in 2020
Snohomish County	Everett and Lynnwood	Lynnwood, Mill Creek, Mukilteo
King County	Kirkland, Redmond, Bellevue, Issaquah, Newcastle, Renton, Tukwila, SeaTac, Kent, Auburn, and Federal Way	Woodinville, Redmond, Bothell, Carnation, Bellevue, Issaquah, Tukwila, SeaTac, Kent, Auburn, Covington, Federal Way
Pierce County	Algona, Pacific, Tacoma, Lakewood	Puyallup, Algona, Pacific, Bonney Lake, Sumner, Lakewood

Despite pressure for additional growth outside of the UGA, substantial growth (Figures 1.3-4 and 1.3-5) still would occur within designated urban centers. The designated urban centers that are expected to receive the highest level of employment growth are Everett, Lynnwood, Redmond, Bellevue, Tukwila/South Center, Kent, SeaTac, Auburn, and Federal Way.

The designated urban centers that would receive the highest level of household growth are Lynnwood, Redmond, Bellevue, Tukwila/South Center, SeaTac, Kent, Federal Way, and Puyallup.

Table 1.3-2 shows current and projected employment and households in 2020 for the counties and study area. It is important to note that the 2020 regional growth projections for the No Action Alternative are nearly the same (within 2 percent) as those for the action alternatives, indicating that there is very little change in overall pressure for growth and development among the alternatives.

Another cumulative effect of the No Action Alternative is the effect on land use and transportation concurrency. The local jurisdictions in the I-405 study area are facing serious traffic concurrency problems. If those issues are not managed effectively and addressed adequately by 2020, it is possible that the planned growth might not be able to be accommodated by local jurisdictions. The existing concurrency problems in most of the local jurisdictions would be exacerbated in the future under the No Action Alternative.

Table 1.3-2: No Action Alternative Changes in Employment and Households

Location	Employment				Households			
	2000	2020	Change	Percent Change	2000	2020	Change	Percent Change
	(a)	(b)	(b)-(a)	2000-2020	(a)	(b)	(b)-(a)	2000-2020
King County	1,180,564	1,474,469	293,905	24.9	741,167	967,180	226,013	30.5
Kitsap County	90,962	120,954	29,992	33.0	96,257	137,421	41,164	42.8
Pierce County	294,393	365,085	70,692	24.0	272,835	348,078	75,243	27.6
Snohomish Co.	233,289	300,568	67,279	28.8	227,522	334,335	106,813	46.9
Regional Total	1,799,208	2,261,076	461,868	25.7	1,337,781	1,787,014	449,233	33.6
Study Area	**447,936**	**576,335**	**128,399**	**28.7**	**270,037**	**360,603**	**90,566**	**33.5**

The average traffic level of service was calculated for jurisdictions within the I-405 study area. The results show virtually every jurisdiction within the study area would reach or exceed currently adopted concurrency levels by 2020, including:

- Tukwila (Southcenter area)
- Renton (most areas)
- Newcastle (western portion)
- Bellevue (downtown, Factoria, Bel-Red)
- Mercer Island
- Kirkland (most areas)
- Redmond (western portions, including Overlake)
- Bothell (Snohomish County portion)
- Mill Creek (most areas)
- Lynnwood (most areas)

If concurrency cannot be achieved, growth would be expected to disperse elsewhere within or outside of the study area where it can be permitted.

Legend: Existing Land Use

Land Use
- Forest
- Open Space
- Agriculture
- Commercial
- Industrial
- Residential
- Government
- Right of way
- Mixed

- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

1 0 1 2 3 Miles

Mill Creek
Lynnwood
Edmonds
Woodway
Mountlake Terrace
Brier
Bothell
Kenmore
Shoreline
Lake Forest Park
Simonds Rd NE
Woodinville
Duvall
NE 128th St
Kirkland
Redmond
Lake Washington
Union Bay
Lake Union
Hunts Point
Clyde Hill
Medina
NE 8th St
Bellevue
Redmond Fall City Rd
Lake Sammamish
Seattle
Beaux Arts
Mercer Island
148th Ave SE
Sammamish
Duwamish River
Coal Creek Pky SE
Newcastle
Issaquah
Tukwila
SE 128th St
Renton
Burien
Normandy Park
SeaTac
SE Petrovitsky Rd
68th Ave
132nd Ave SE
Kent
Des Moines
Maple Valley
Covington
Auburn
Federal Way

Existing Land Use within the Study Area

Figure No. 1.3-3

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Legend: Cumulative Effects of the No Action Alternative (Change in Employment from 2000 to 2020)

Employment Change in FAZ
- < 500
- 500 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- > 3999
- Urban Growth Area

- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

4 0 4 8 Miles

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Cumulative Effects of the No Action Alternative (Change in Employment from 2000 to 2020)

Figure No. 1.3-4

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Legend: Cumulative Effects of the No Action Alternative (Change in Households from 2000 to 2020)

Household Change in FAZ
- < 500
- 500 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- > 3999

Study Area Boundary

County Boundaries

Highways

Roadways

Railways

Urban Growth Area

N

3 0 3 6 Miles

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Cumulative Effects of the No Action Alternative (Change in Households from 2000 to 2020)

Figure No. 1.3-5

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This could exacerbate pressure for growth in rural areas outside the UGA or premature growth at the urban fringe of the UGA. If allowed to occur by local land use agencies, this pattern of growth would have potential cumulative effects such as increased demand on the transportation infrastructure, demand on public services, adverse impacts on the environment, vehicular congestion, and long-term increases in the cost of providing public services.

Alternative 1: HCT/TDM Emphasis

Compared to the No Action Alternative, under Alternative 1 the I-405 corridor could experience a slightly greater concentration of employment within the study area and a greater number of households within the designated urban centers and around the HCT stations within the corridor. See Table 1.3-3.

Table 1.3-3: Alternative 1 Changes in Employment and Housing from the No Action Alternative

	2020 Employment				2020 Households			
Location	No Action Alternative (a)	Alternative 1 (b)	Change (b) – (a)	Percent Change From No Action Alternative	No Action Alternative (a)	Alternative 1 (b)	Change (b) – (a)	Percent Change From No Action Alternative
King County	1,474,469	1,471,969	-2,500	-0.2	967,180	965,682	-1,498	-0.2
Kitsap County	120,954	120,921	-33	0.0	137,421	137,543	-122	0.1
Pierce County	365,085	364,995	-90	0.0	348,078	348,063	-15	0.0
Snohomish Co.	300,568	303,204	2,636	0.9	334,335	335,855	1,520	0.5
Regional Total	2,261,076	2,261,089	13	0.0	1,787,014	1,787,143	129	0.0
Study Area	**576,335**	**575,882**	**-453**	**-0.1**	**360,603**	**360,573**	**-30**	**0.0**

Figure 1.3-6 shows projected employment under Alternative 1. Employment growth could result along the I-405 and SR 167 corridors where new fixed-guideway HCT and TDM strategies would be implemented.

Figure 1.3-7 shows projected households under Alternative 1. On a sub-regional level, Alternative 1 could influence pressure on the Eastgate, Factoria, Kent, Kirkland, Lynnwood, and Redmond areas to allow additional employment and housing. The household growth could take place around the urban centers with an improved range of multi-modal transportation choices to regional employment centers, coupled with the future station area planning and implementation of Sound Transit's Sound Move program. This trend would likely emerge as regional and local plans and implementation programs support transit-supportive land uses.

However, since Alternative 1 would not reduce the levels of traffic congestion in much of the study area, compared to the No Action Alternative, it would not be effective in addressing the concurrency problems at the local level. The increased pressure for employment and population growth described above would need to be matched with local actions to maintain adequate transportation levels of service. Without effective transportation improvements, projected growth might not be realized as planned and development could disperse to less suitable areas outside the urban centers and UGA.

Alternative 2: Transit Emphasis

Compared to the No Action Alternative, pressure for growth in employment would be expected to increase in the I-405 corridor and decrease for Seattle, Pierce County, and, to a lesser degree, Kitsap County. Figure 1.3-8 shows the projected employment pattern in the region under Alternative 2. The future employment is forecast to increase in the northeastern and southern portions of the I-405 corridor, specifically in Redmond, the Duvall UGA, and the Kent Valley. See Table 1.3-4.

Table 1.3-4: Alternative 2 Changes in Employment and Housing from the No Action Alternative

	2020 Employment				2020 Households			
Location	No Action Alternative (a)	Alternative 2 (b)	Change (b) – (a)	Percent Change From No Action Alternative	No Action Alternative (a)	Alternative 2 (b)	Change (b) – (a)	Percent Change From No Action Alternative
King County	1,474,469	1,473,785	-684	0.0	967,180	966,821	-359	0.0
Kitsap County	120,954	120,068	-886	-0.7	137,421	135,956	-1,465	-1.1
Pierce County	365,085	363,894	-1,191	-0.3	348,078	347,789	-289	-0.1
Snohomish Co.	300,568	303,343	2,775	0.9	334,335	336,574	2,239	0.7
Regional Total	2,261,076	2,261,090	14	0.0	1,787,014	1,787,140	126	0.0
Study Area	**576,335**	**579,866**	**3,351**	**0.6**	**360,603**	**364,554**	**3,951**	**1.1**

The overall pattern of change in households under Alternative 2 would be similar to that in Alternative 1, although additional pressure for household growth may occur in the Mill Creek, Lynnwood, and Bothell areas in the north, and in Federal Way and Kent to the south. Figure 1.3-9 shows the projected pattern of households under Alternative 2. It is projected that the number of households would increase in south Snohomish County, Redmond, Kirkland, Kent, Auburn, and Federal Way. It is expected that the urban centers (Canyon Park, Lynnwood, SeaTac, Kent, and Federal Way) would absorb much of the growth.

In Alternative 2, the urban centers and future HCT stations would likely become stronger focal points for growth in employment and households in support of the land use strategies of the region, and in relation to transit-oriented development (TOD). TOD would be likely in the urban centers and in the corridor between the centers regardless of the timing of light rail, as it is regional policy and an economic tool for local jurisdictions.

The overall effects under Alternative 2 would be similar to Alternative 1, except that Alternative 2 would add capacity to I-405 and provide some reduction in study area traffic congestion. This would better allow local jurisdictions to meet concurrency requirements in a manner that would facilitate the clustering of growth and development within urban centers and the UGA. Alternative 2 would conform to local plans to help reduce the spillover or continued pattern of growth outside of the UGA; however, the increased pressure for employment and population growth would still need to be matched with local actions to maintain adequate transportation levels of service. Without effective transportation improvements, projected growth might not be realized as planned and development could disperse to less suitable areas outside the urban centers and UGA.

Legend: Cumulative Effects (Change in Employment for Alt. 1 @ 2020 from the No Action Alt. @ 2020)

Employment Change in FAZ

- < 249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

- Urban Growth Area
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

2 0 2 4 6 Miles

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Cumulative Effects (Change in Employment for Alt. 1 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-6

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Legend: Cumulative Effects (Change in Households for Alt. 1 @ 2020 from the No Action Alt. @ 2020)

Household Change in FAZ

- < -249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

Urban Growth Area

Study Area Boundary

County Boundaries

Highways

Roadways

Railways

N

2 0 2 4 Miles

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Cumulative Effects (Change in Households for Alt. 1 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-7

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Legend: Cumulative Effects (Change in Employment for Alt. 2 @ 2020 from the No Action Alt. @ 2020)

Employment Change in FAZ

- < 249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

- Urban Growth Area
- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

2 0 2 4 6 Miles

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Cumulative Effects (Change in Employment for Alt. 2 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-8

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Legend: Cumulative Effects (Change in Households for Alt. 2 @ 2020 from the No Action Alt. @ 2020)

Household Change in FAZ

- < -249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

Urban Growth Area

Study Area Boundary

County Boundaries

Highways

Roadways

Railways

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Cumulative Effects (Change in Households for Alt. 2 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-9

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Alternative 3: Mixed Mode Emphasis

Compared to the No Action Alternative, pressure for employment and housing growth would be expected to increase in the study area and UGA in Alternative 3. This would support planned development in designated urban centers and around the HCT stations. Alternative 3, as shown in Table 1.3-5, would have effects similar to Alternative 2, but with increased pressure for employment and households within the corridor. From a regional perspective, the added capacity on I-405, the BRT system, increased reliance on HOV projects, arterial improvements, and implementation of TDM strategies would create improved accessibility to those portions of the I-405 corridor already planned for higher urban densities.

Table 1.3-5: Alternative 3 Changes in Employment and Housing from the No Action Alternative

	2020 Employment				2020 Households			
Location	No Action Alternative (a)	Alternative 3 (b)	Change (b) – (a)	Percentage Change From No Action Alternative	No Action Alternative (a)	Alternative 3 (b)	Change (b) – (a)	Percent Change From No Action Alternative
King County	1,474,469	1,474,905	436	0.0	967,180	967,883	703	0.1
Kitsap County	120,954	119,289	1,665	-1.4	137,421	134,539	2,882	-2.1
Pierce County	365,085	363,257	1,828	-0.5	348,078	346,729	1,349	-0.4
Snohomish Co.	300,568	303,650	3,082	1.0	334,335	338,008	3,673	1.1
Regional Total	2,261,076	2,261,101	25	0.0	1,787,014	1,787,159	145	0.0
Study Area	**576,335**	**582,455**	**6,120**	**1.1**	**360,603**	**367,600**	**6,997**	**1.9**

Figures 1.3-10 and 1.3-11 show the differences in the projected pattern of employment and households under Alternative 3. The projected pressure for growth would be similar to Alternative 2, but with greater forecast employment and households in the northern and southern portions of the I-405 corridor.

Alternative 3 is similar to Alternative 2 in that the urban centers and the transit stations would become stronger focal points for growth in employment and households. There are two areas within the study area (Kirkland/Redmond and Newcastle/Renton/Kent) that would be expected to experience greater pressure for growth in employment and households as seen under Alternative 3 (Figures 1.3-10 and 1.3-11). Alternative 3 could enhance planned growth within key portions of the UGA planned for higher density development. This alternative supports regional policies seeking to create connectivity, density, and transit-oriented development to reduce growth impacts outside the UGA. The growth pattern associated with Alternative 3, when compared to the No Action Alternative, suggests that it may result in lessening of growth pressures on lands outside the UGA.

Alternative 3 provides for the greatest implementation of projects that are supportive of *Destination 2030* policies and locally adopted comprehensive plans. All of these regional and local policies call for the improvement of the regional transportation infrastructure and reduction in traffic congestion. The capacity expansions on I-405 included in Alternative 3 would shift some traffic onto I-405 from the arterials and provide reduction in study area traffic congestion. Thus, this alternative would provide the best opportunity for local agencies to meet

concurrency standards, implement clustering of development, and increase density within the urban centers and the UGA with a transportation system that serves as required under the Growth Management Act.

Alternative 4: Roadway Capacity Emphasis

Under Alternative 4, as shown in Table 1.3-6, pressure for employment and housing would be expected to increase in the I-405 corridor as compared to the No Action Alternative. Figure 1.3-12 shows the projected employment pattern in the region under Alternative 4. Additional pressure for employment in the Woodinville, Kirkland, and Renton/Kent Valley area would be expected partially due to increased accessibility. Alternative 4 is forecast to result in less employment outside of the UGA compared to the No Action Alternative condition.

Table 1.3-6: Alternative 4 Changes in Employment and Housing from the No Action Alternative

	2020 Employment				2020 Households			
Location	No Action Alternative (a)	Alternative 4 (b)	Change (b) – (a)	Percent Change From No Action Alternative	No Action Alternative (a)	Alternative 4 (b)	Change (b) – (a)	Percent Change From No Action Alternative
King County	1,474,469	1,474,966	497	0.0	967,180	966,953	227	0.0
Kitsap County	120,954	119,076	1,878	-1.6	137,421	134,410	3,011	-2.2
Pierce County	365,085	362,941	2,144	-0.6	348,078	346,376	1,702	-0.5
Snohomish Co.	300,568	304,111	3,543	1.2	334,335	339,399	5,064	1.5
Regional Total	2,261,076	2,261,094	18	0.0	1,787,014	1,787,138	124	0.0
Study Area	**576,335**	**583,044**	**6,709**	**1.2**	**360,603**	**368,218**	**7,615**	**2.1**

Figure 1.3-13 shows the projected household pattern in the region. The number of households is forecast to increase within the UGA compared to the No Action Alternative, but there also could be more growth at the outer edges of the UGA.

The forecast growth pattern under Alternative 4, when compared to the No Action Alternative, suggests a different trend for pressure to occur outside of the UGA, which also could result in increased growth pressure on the fringe areas of the UGA not currently planned for higher urban densities. This would be considered a negative impact on land use outside of the UGA and is not supported by *Destination 2030* or the CWPP.

Alternative 4 would perform similar to Alternative 3 with regard to addressing the long-term concurrency problems facing local jurisdictions. The capacity expansions on I-405 included in Alternative 4 would shift traffic onto I-405 from the arterials and reduce study area traffic congestion. This would improve opportunities relative to Alternatives 1 and 2 for clustering of development and increasing density within the urban centers and the UGA without triggering limitations under concurrency ordinances.

Legend: Cumulative Effects (Change in Employment for Alt. 3 @ 2020 from the No Action Alt. @ 2020)

Employment Change in FAZ

- < 249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500
- Urban Growth Area

- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

N

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Cumulative Effects (Change in Employment for Alt. 3 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-10

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Legend: Cumulative Effects (Change in Households for Alt. 3 @ 2020 from the No Action Alt. @ 2020)

Household Change in FAZ

- < -249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

Urban Growth Area

Study Area Boundary

County Boundaries

Highways

Roadways

Railways

N

2 0 2 4 6 Miles

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Cumulative Effects (Change in Houseolds for Alt. 3 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-11

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Legend: Cumulative Effects (Change in Employment for Alt. 4 @ 2020 from the No Action Alt. @ 2020)

Employment Change in FAZ

- < 249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500
- Urban Growth Area

- Study Area Boundary
- County Boundaries
- Highways
- Roadways
- Railways

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Cumulative Effects (Change in Employment for Alt. 4 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-12

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Legend: Cumulative Effects (Change in Households for Alt. 4 @ 2020 from the No Action Alt. @ 2020)

Household Change in FAZ

- < -249
- -249 to -51
- -50 to 50
- 51 to 249
- 250 to 499
- > 500

Urban Growth Area

Study Area Boundary

County Boundaries

Highways

Roadways

Railways

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Cumulative Effects (Change in Households for Alt. 4 @ 2020 from the No Action Alt. @ 2020)

Figure No. 1.3-13

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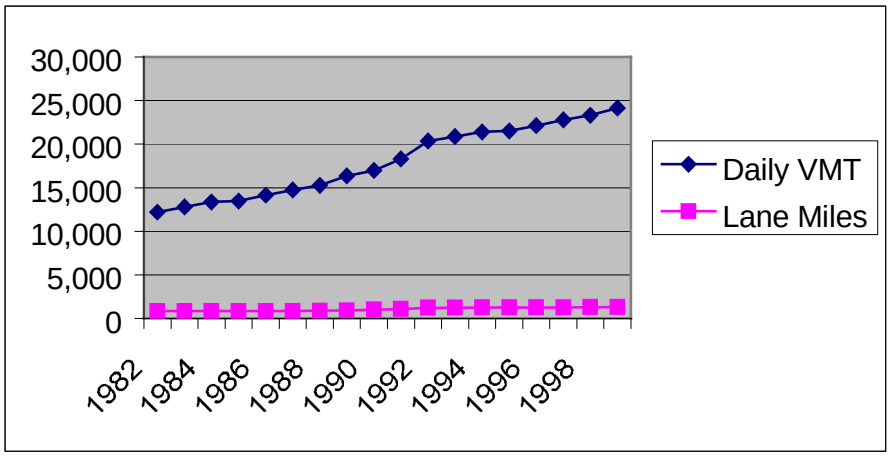
1.3.6 Traffic and Transportation

Roadway Network

The I-405 corridor is one of many transportation corridors within the regional network of roadways connecting communities throughout the Puget Sound. The four-county region has more than 11,400 lane miles. The I-405 corridor study area has about 13 percent of the region's roadways. Because of the relatively sparse roadway network in the I-405 study area (about 1,500 lane-miles in the 250-square-mile area), there is greater reliance on state highways to serve non-regional trips than would normally be the case. Interstate 405 is the transportation backbone of the study area, and travel demand within the study area is heaviest on I-405 itself.

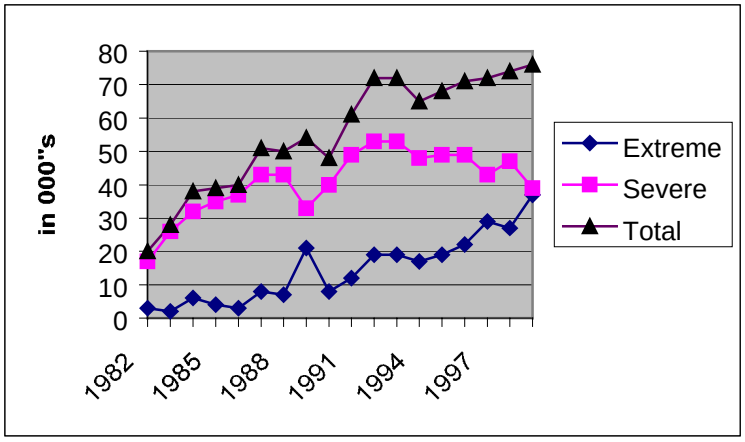
Figure 1.3-14 shows the growth of freeway lane miles and daily VMT in the region over the past 20 years. Figure 1.3-15 shows the result, increasing percentage of lanes with peak period congestion. Extreme congestion continues to increase each year, as the freeways have become more crowded during the peak hours.

Figure 1.3-14: Growth in Freeway Region-wide Daily VMT (000's) and Freeway Lane Miles 1982-2000



Source: Texas Institute Mobility Data for Seattle-Everett, 2001 Urban Mobility Study

Figure 1.3-15: Percent of Peak Period Travel in Severe or Extreme Congestion (1982-2000)



Source: Texas Institute Mobility Data for Seattle-Everett, 2001 Urban Mobility Study

Traffic Volumes and Travel Demand

In evaluating the regional cumulative effects of the I-405 Corridor Program, the forecasts for population, employment, and travel demand in the corridor were compared to forecasts for the four-county central Puget Sound region. Several observations were made. As the Eastside has grown, traffic volumes have increased dramatically. From 1970 to 1999, the average daily traffic on I-405 north of I-90 increased nearly five-fold, growing from 41,000 to 198,000 cars per day. The roadway network has not expanded at the same rate, resulting in increased congestion on all the roads, especially on the I-405 freeway.

While the entire corridor experienced almost a 400 percent increase in traffic volumes from 1970-1999, various sections of I-405 show different rates of traffic growth. From 1980 to 2000, the increase in the corridor was 150 percent, as capacity was reached on several sections of I-405. Table 1.3-7 presents a historical summary of the average annual daily traffic on selected arterials and state roads in the I-405 Corridor Program study area.

Table 1.3-7: Average Annual Daily Traffic on Selected Arterial and State Roads in I-405 Study Area (1965 to 1999)

Measurement Location	1965	1970	1975	1980	1985	1990	1995 baseline	1999
I-405 north of I-90	24,400a	41,000a	53,400a	80,100a	115,400a	137,600c	164,832	198,000c
I-405 north of SR 520	12,100a	33,400a	48,400a	76,400a	107,400a	146,800c	152,174	178,000c
I-405 north of SR 522	N/A	15,000a	20,300a	37,200a	52,700a	88,400c	92,822	94,000c
I-405 south of I-90	24,000	N/A	N/A	76,000c	115,400c	129000	116,525	168,000c
SR 522 west of I-405	N/A	N/A	N/A	21,500c	24,800c	30000	32,000c	38,000c
SR 908 east of I-405 (Rose Hill)	N/A	N/A	N/A	24,800c	28,300c	30000	31,000c	46,300d
148th Ave SE north I-90	N/A	15,000a	18,400a	22,600a	30,200a	N/A	N/A	39,700e
Lake Wa Blvd north of SR 520	2,200a	11,800a	11,700a	23,000a	27,500a	N/A	N/A	N/A
I-90 Mercer Island Bridge	17,900 b 42,892a	48,352a	48,655a	52,283a	68,500a	112,400c	128,000c	121,000c
SR 520 Lake Wash. Bridge	22,998a	37,744a	47,544a	72,130a	99,500a	97,700c	100,000c	110,000c

a Eastside Transportation Program, Background Report, October 1988, p. 4.
b Number of vehicles in 1961, Puget Sound Regional Transportation Study
c WSDOT Annual Traffic Report, 1983, 1985, 1991, 1994, 1996
d City of Kirkland, 1999 traffic counts
e City of Bellevue , 2000 traffic counts

The forecasts for VMT and VHT in the study area are expected to follow the region's forecasted trend of a greater than 50 percent increase between 1999 and 2020. Table 1.3-8 presents the historical growth in VMT and VHT for the I-405 study area from 1980 to 2000, including the 2020 No Action Alternative, and the growth for the four-county region during the same time period.

Table 1.3-8: VMT and VHT for Study Area and Region

	VMT (Daily)		VHT (Daily)	
Alternative	Study Area (trips within)	Region-wide	Study Area (trips within)	Region-wide
1980	9,322,000	39,500,000	359,800	1,411,000
1990	14,962,400	63,400,000	529,100	2,075,000
1995	16,346,000	69,412,000	586,000	2,295,000
2020 No Action Alternative	22,510,000	100,571,000	1,156,000	3,948,000
Change vs. 1995 (%)	37.7%	44.9%	97.3%	72.0%
Alternative 1	22,563,000	100,497,000	1,155,000	3,941,000
Change vs. No Action Alternative (%) Change vs. 1995	0.2% 38.0%	-0.1% 44.7%	-0.1% 97.2%	-0.2% 71.7%
Alternative 2	24,215,000	101,560,000	1,164,000	3,922,000
Change vs. No Action Alternative (%) Change vs. 1995	7.6% 48.1%	1.0% 46.3%	0.7% 98.6%	–0.7% 70.9%
Alternative 3	25,346,000	102,263,000	1,170,000	3,907,000
Change vs. No Action Alternative (%) Change vs. 1995	12.6% 55.0%	1.7% 47.3%	1.2% 99.7%	-1.0% 70.2%
Alternative 4	26,208,000	102,730,000	1,184,000	3,903,000
Change vs. No Action Alternative (%) Change vs. 1995	16.4% 60.3%	2.1% 48.9%	2.4% 102.0%	-1.14% 70.1%

Source: PSRC Model

Without accounting for the potential effects of TDM, VMT in the study area is expected to increase under each alternative. Alternatives 3 and 4 show the largest increases in the study area VMT (13 percent and 16 percent, respectively). Regional VMT increases by 1 to 2 percent for Alternatives 2 through 4, while Alternative 1 reduces regional VMT slightly. When the TDM program is included in the action alternatives, study area VMT could be reduced for each of the action alternatives by 5 percent or more.

Study area VHT decreases slightly with Alternative 1 (not including TDM effects). Alternatives 2, 3, and 4 result in increases in VHT because of the additional travel within the corridor. However, regional VHT decreases with each alternative, up to slightly more than 1 percent under Alternative 4. The effects are most pronounced during the PM peak period. The TDM program could further reduce study area VHT for each of the action alternatives.

Trips in the study area are forecasted to increase by 50 percent between 1999 and 2020, similar to the regional increase. For the year 2020, the trip pattern percentages in the region are expected to be similar to those currently in the region. In the I-405 Corridor Program study area, the relative shares of each trip purpose are expected to be similar in 2020 to those currently in the corridor. Trip distribution, i.e., where trips are going to and coming from in relation to the study area, are also forecasted to change very little by year 2020 in the I-405 corridor. More than 55 percent of daily trips begin and end within the study area, with the remaining 45 percent of trips beginning or ending outside the study area. Over 70 percent of the total daily person-trips are less than 10 miles within the study area; less than 10 percent of the trips are over 30 miles in length. These trip patterns are expected to continue in the corridor in the year 2020, although there could be a slightly higher percentage of trips averaging over 30 miles in length.

Performance of I-405 Corridor Program Improvements in the Region

As previously discussed, the I-405 Corridor Program study area includes 21 percent of the regional population, and produces about 24 percent of the region's trips. This percentage has held relatively constant for the past 30 years and is forecasted to continue for the next 30 years given the current plans and policies in the region. As part of the second level screening for the four action alternatives, the travel demand model was used to examine the effects of improvements by forecasting performance measures such as transit ridership, highway congestion, traffic volumes, and mode share shifts on I-405 and the study area. The transportation performance measures for the region in *Destination 2030* include the cumulative effects of the more prominent transportation improvements proposed in the I-405 Corridor Program, as noted above. Table 1.3-9 provides a comparison of performance measures.

Table 1.3-9: Performance Measures for Destination 2030 (Regional) and I-405 Study Area

	Destination 2030 (MTP)	1995 Baseline	2020 No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VMT (daily total) Region-wide	93,562,322						
VMT (daily total) Study area		16,346,000	22,510,000	22,563,000	24,215,000	25,346,000	26,208,000
VHT (daily) Region-wide	3,226,300						
VHT (daily) Study area		586,000	1,156,000	1,155,000	1,164,000	1,170,000	1,184,000
Mode Share - all trips (weekday)							
SOV	55%	99%	96.00%	96.00%	96.00%	96.00%	96.00%
2+ Carpool	39%	Included above	Included above	Included above	Included above	Included above	Included above
3+ Carpool		1%	2%	2%	2%	2%	2%
Transit	5%	1%	2%	2%	2%	3%	2%
Mode Share - commute							
SOV	56%	95%	84%	83%	83%	83%	83%
2+ Carpool	32%	Included above	Included above	Included above	Included above	Included above	Included above
3+ Carpool	Included above	2%	9%	9%	9%	9%	9%
Transit	12%	3%	7%	8%	8%	8%	8%
Average Speeds in MPH							
AM Peak	35	30	26	26	27	28	29
PM Peak	32	24	13	13	13	14	14
Daily	34	28	19	20	21	22	22

Source: Destination 2030 (MTP):

Destination 2030 adopted May 24, 2001 (Metropolitan Transportation Plan for the Central Puget Sound Region); Technical Appendix 8: Destination 2030 System Performance.
For all other columns including - the 1995 Baseline, 2020 No Action Alternative, and the four Alternatives -- the source is the *I-405 Corridor Program Draft Transportation Expertise Report* (Mirai and DEA, 2001), February 2001.

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